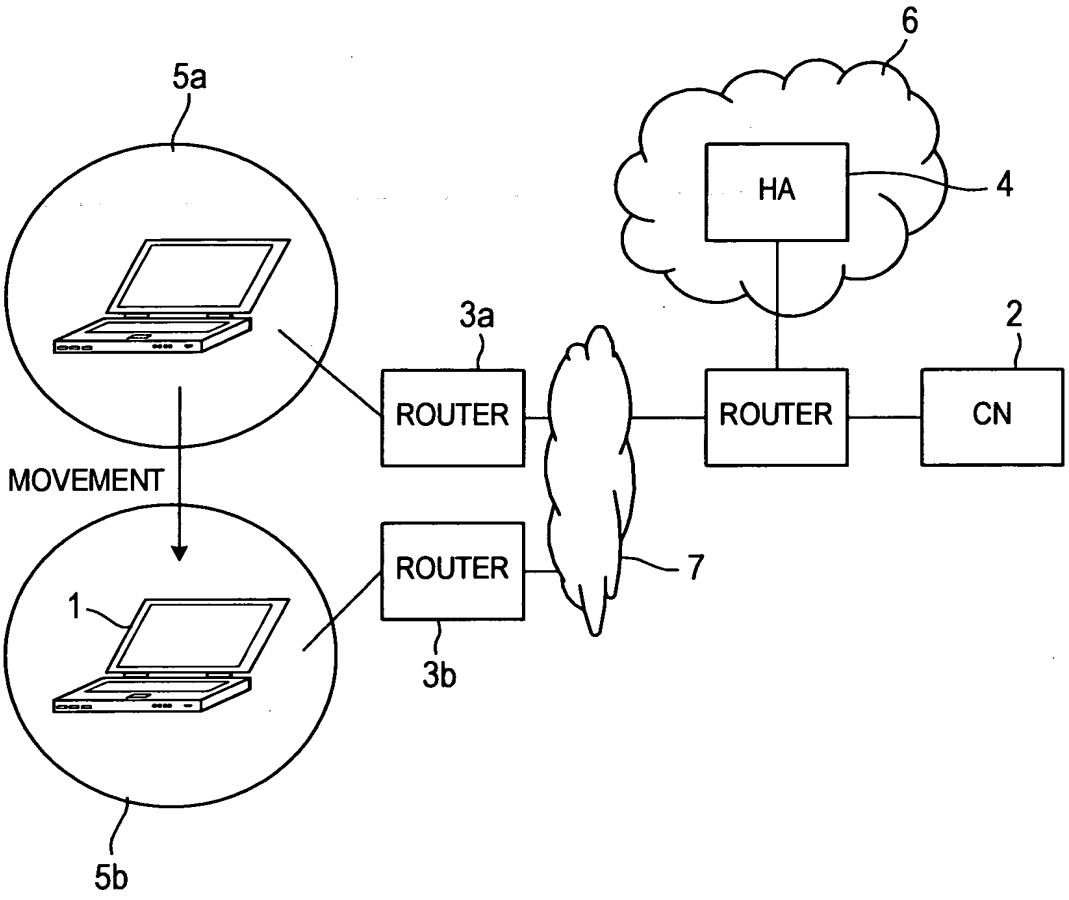

FIG. 1

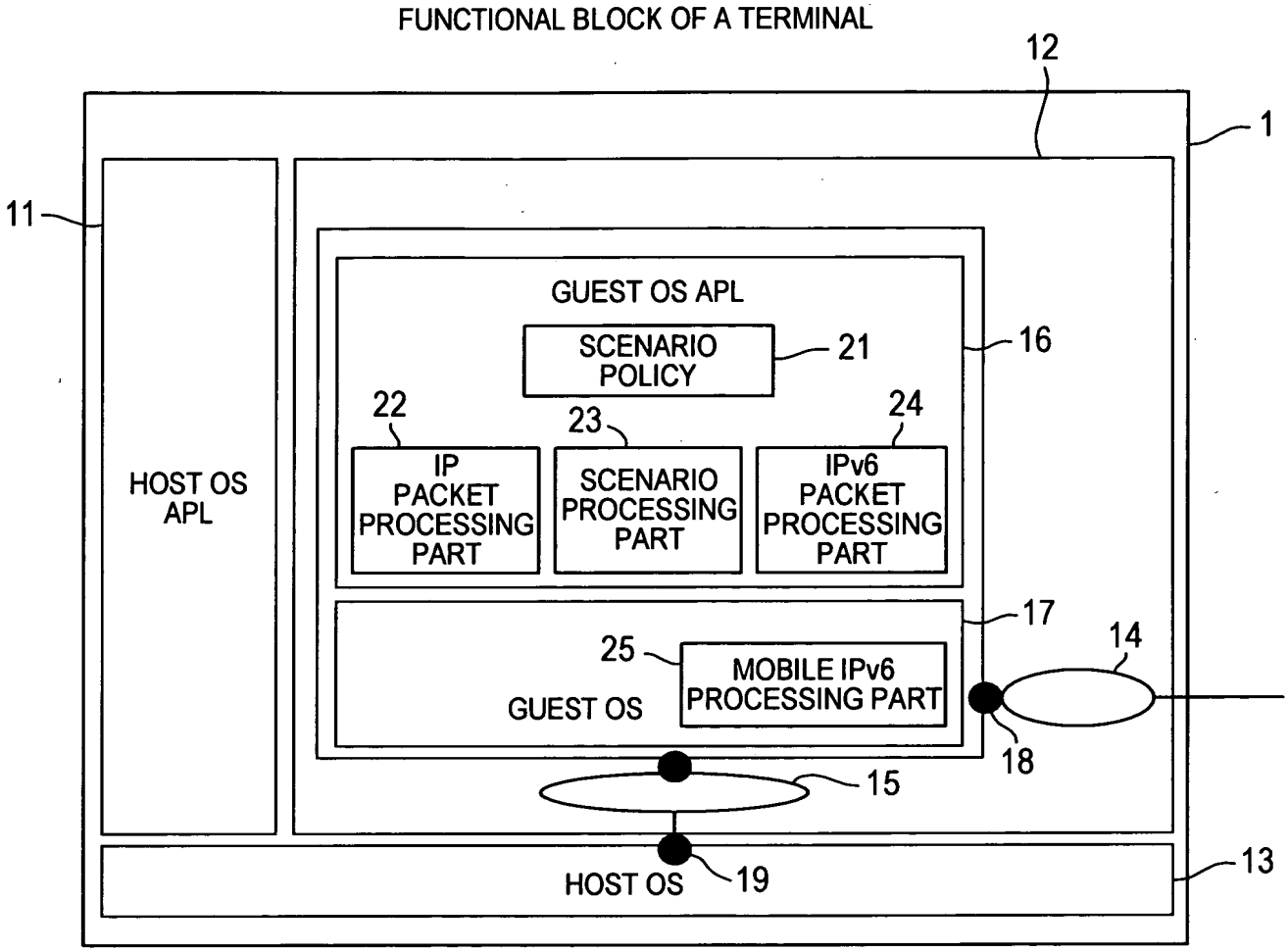
FUNCTIONAL BLOCK OF A TERMINAL
12
1
11
HOST OS APL
GUEST OS APL
SCENARIO POLICY
21
16
22
23
24
IP PACKET PROCESSING PART
SCENARIO PROCESSING PART
IPv6 PACKET PROCESSING PART
17
14
25
MOBILE IPv6 PROCESSING PART
GUEST OS
18
15
HOST OS
19
13

FIG. 2

210 BINDING UPDATE LIST MANAGEMENT TABLE

211 BU DESTINATION ADDRESS	212 HOME ADDRESS	213 CARE OF ADDRESS	214 LIFETIME	
				210 -1
				210 -2
				210 -n

FIG. 3

220 SCENARIO POLICY MANAGEMENT TABLE

221 SCENARIO NUMBER	222 SCENARIO CONTENTS	223 STATUS	
10000	IPv4 -IPv6 TRANSLATION (NO IPsec)	OFF	221 -1
10001	NO IPv4 -IPv6 TRANSLATION (NO IPsec)	OFF	221 -2
10010	IPv4 -IPv6 TRANSLATION	OFF	221 -3
10011	IPv4 -IPv6 TRANSLATION ROUTE OPTIMIZATION	OFF	221 -4
11000	NO IPv4 -IPv6 TRANSLATION	OFF	221 -5
11000	NO IPv4 -IPv6 TRANSLATION ROUTE OPTIMIZATION	OFF	221 -6
10100	MAP TYPE 1	OFF	221 -7
10200	MAP TYPE 2	OFF	221 -8
10300	MAP TYPE 3	OFF	221 -9

FIG. 4

FUNCTIONAL BLOCK OF A TERMINAL

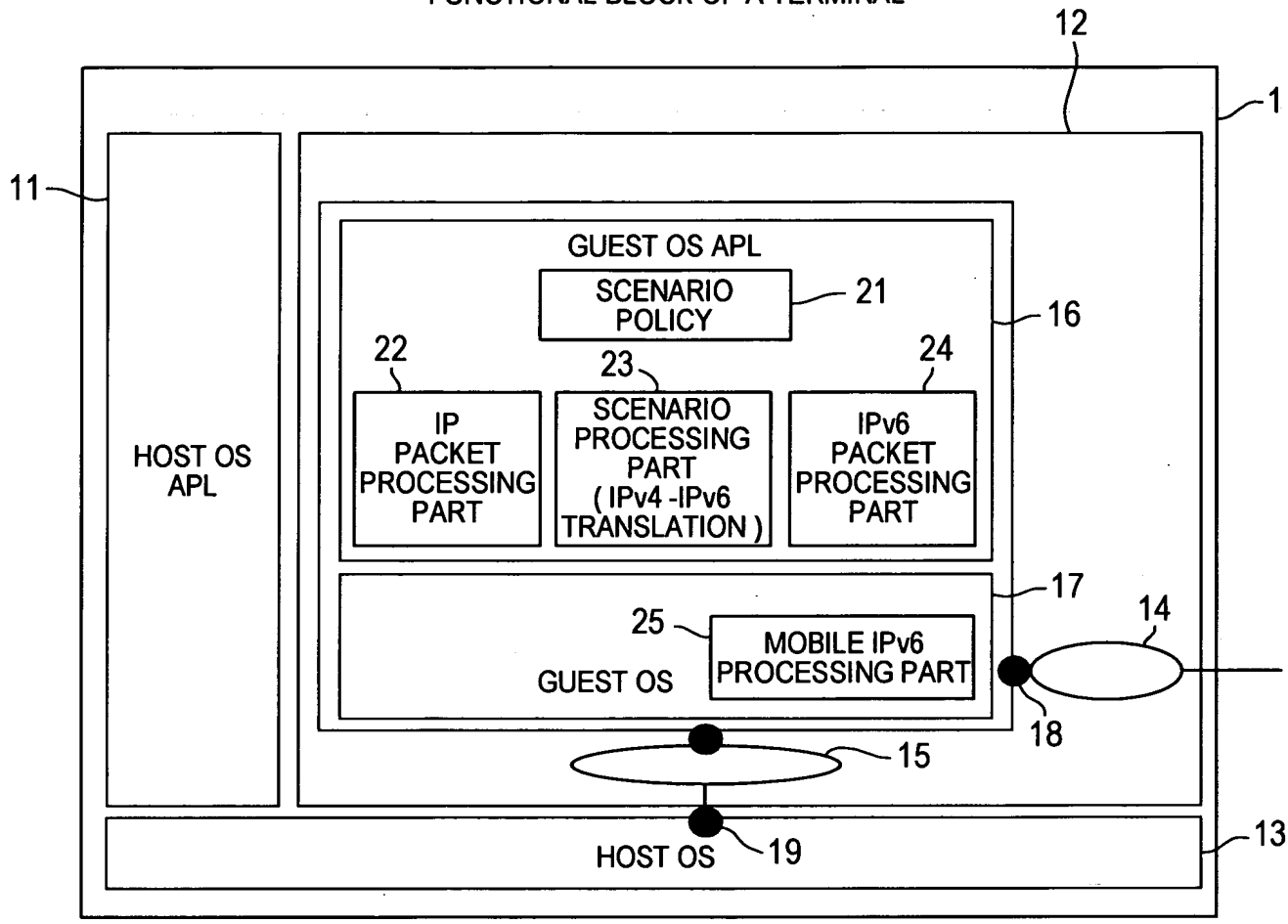

FIG. 5

230 IPv4 -IPv6 TRANSLATION TABLE

231 IPv6	232 IPv4	233 LIFETIME	
2000:0:0:7::1000 (HoAv6)	192. 168. 0. 10 (HoAv4)	xxx	230 -1
2000:0:0:8::1001 (CN v6)	192. 168. 0. 100 (CN TEMPORARY v4)	yyy	230 -2
			230 -n

FIG. 6

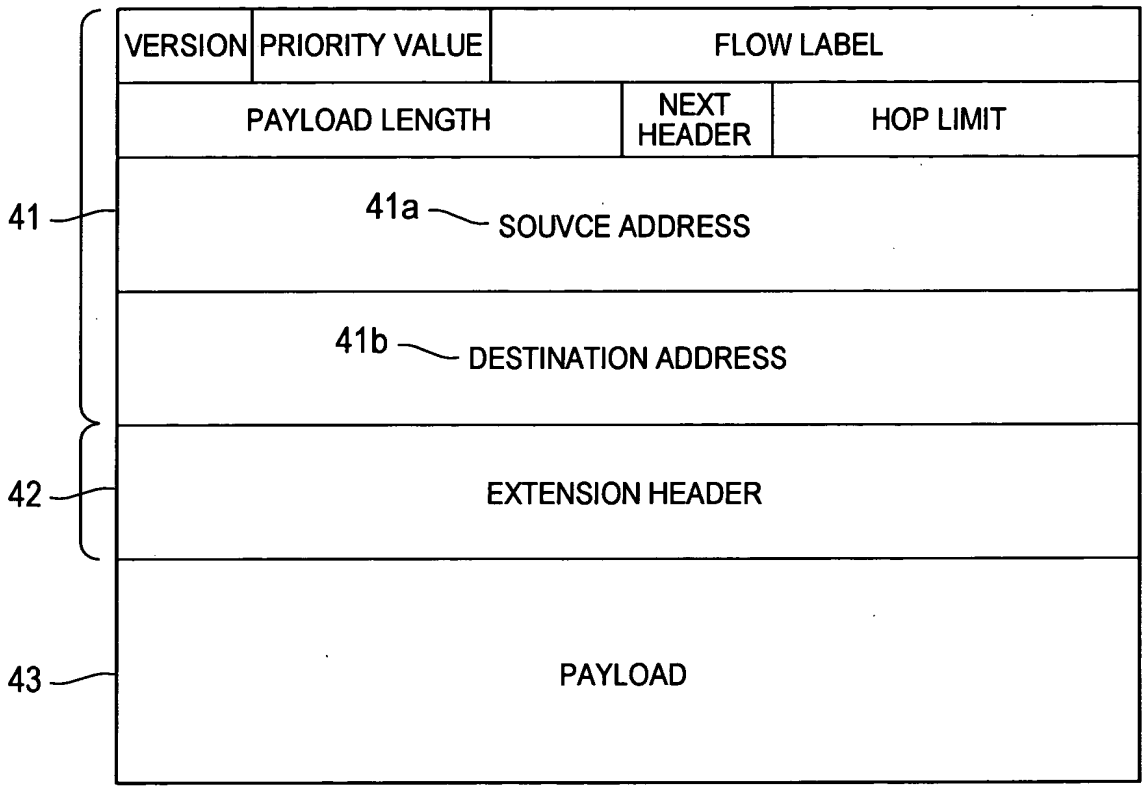
VERSION
PRIORITY VALUE
FLOW LABEL
PAYLOAD LENGTH
NEXT HEADER
HOP LIMIT
41
41a
SOUVCE ADDRESS
41b
DESTINATION ADDRESS
42
EXTENSION HEADER
43
PAYLOAD

FIG. 7

S1 BINDING ACKNOWLEDGEMENT MESSAGE FORMAT

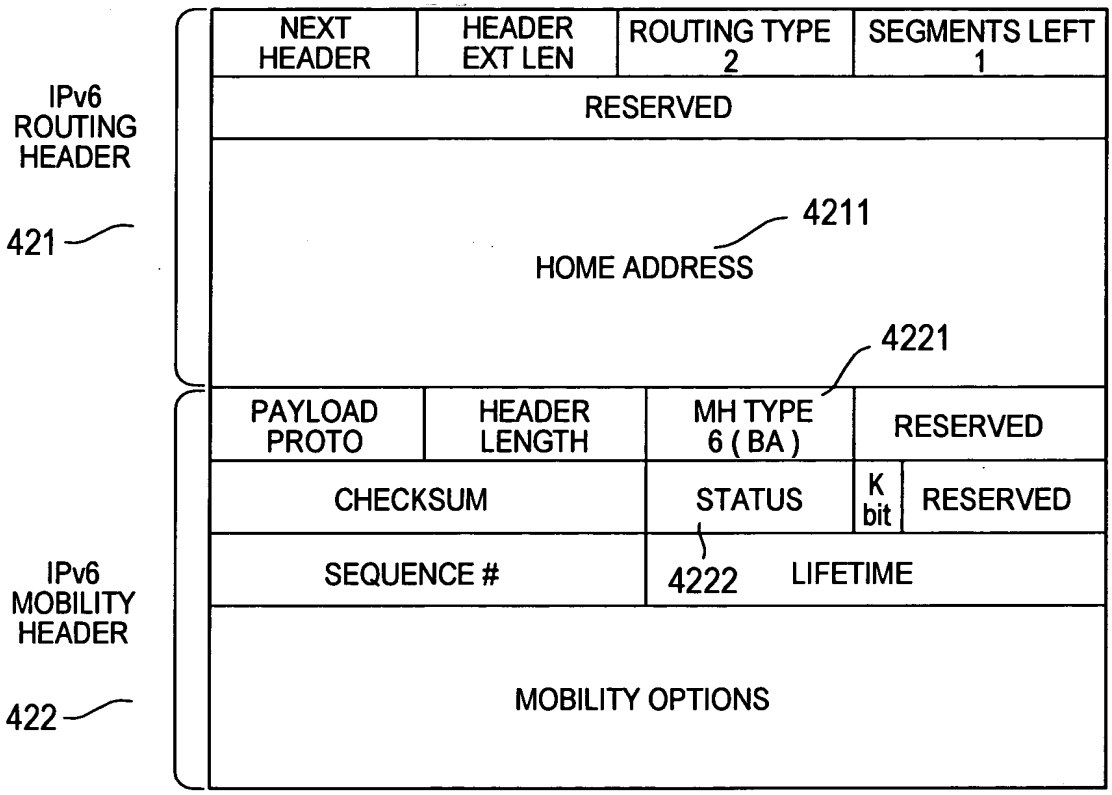

FIG. 8

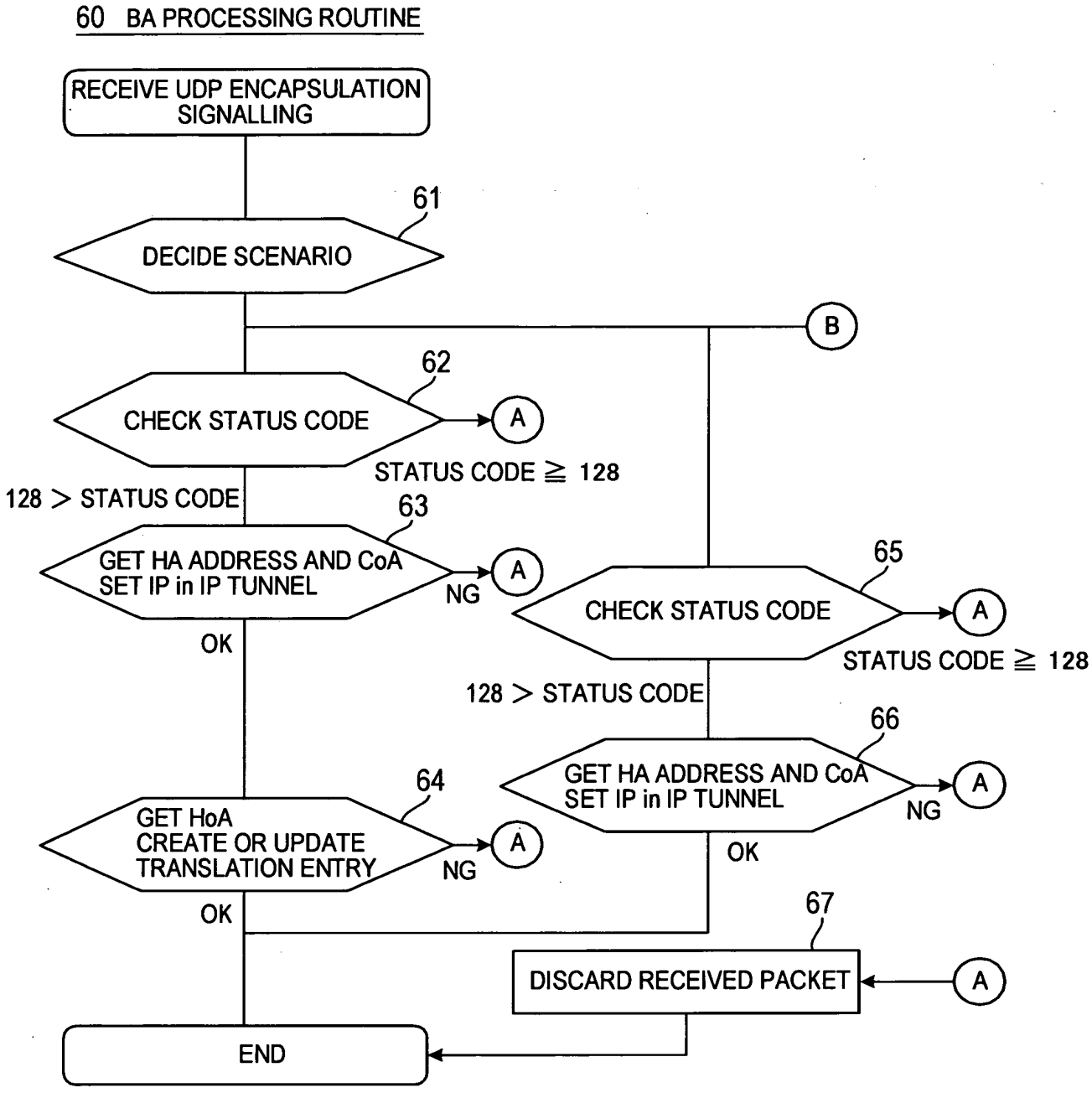
60 BA PROCESSING ROUTINE
RECEIVE UDP ENCAPSULATION SIGNALLING
61
DECIDE SCENARIO
B
62
CHECK STATUS CODE
A
STATUS CODE ≧ 128
128 > STATUS CODE
63
GET HA ADDRESS AND CoA SET IP in IP TUNNEL
NG
A
OK
65
CHECK STATUS CODE
A
STATUS CODE ≧ 128
128 > STATUS CODE
66
GET HA ADDRESS AND CoA SET IP in IP TUNNEL
A
NG
OK
64
GET HoA CREATE OR UPDATE TRANSLATION ENTRY
NG
A
OK
67
DISCARD RECEIVED PACKET
A
END

FIG. 9

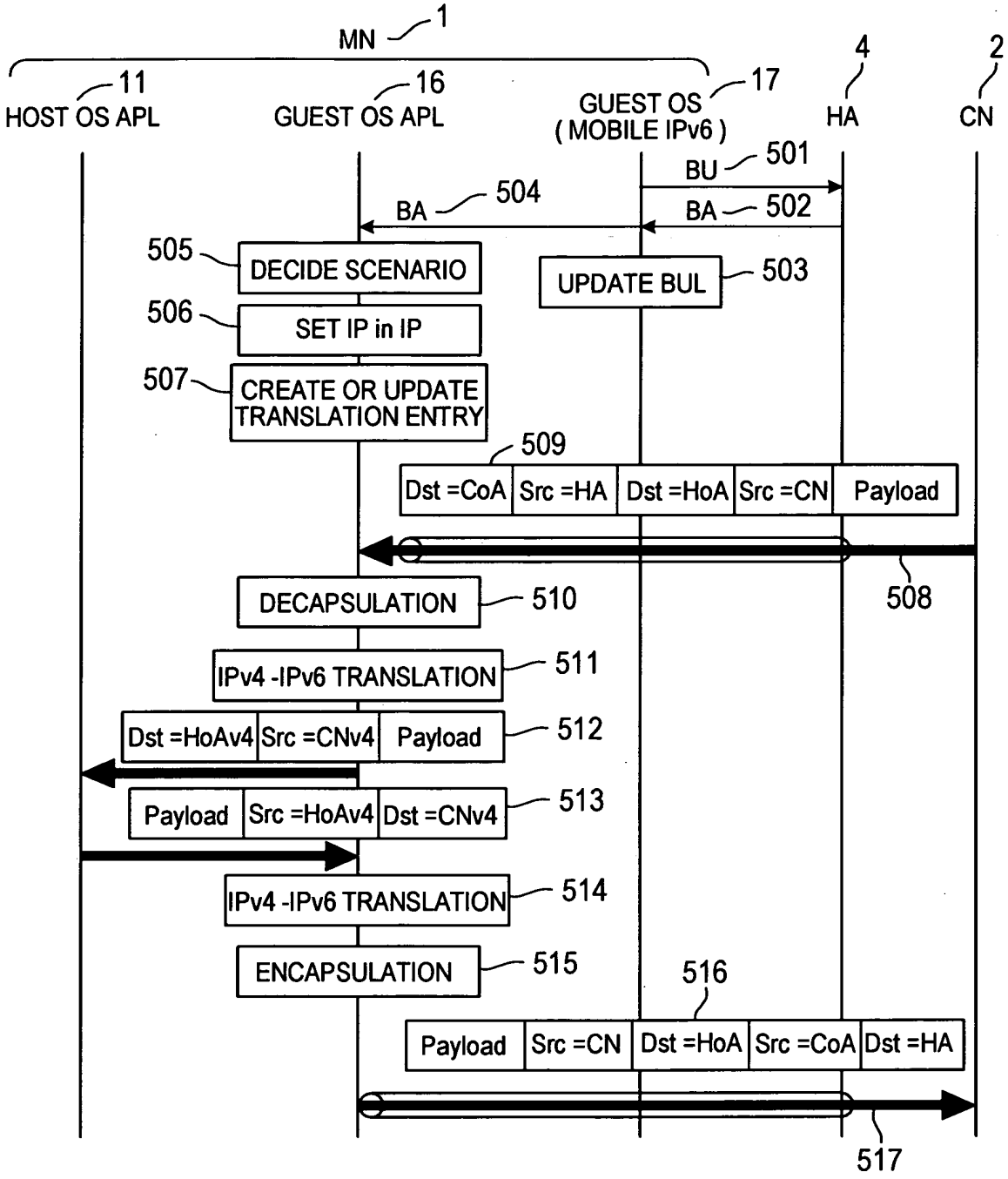
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
CN
2
BU
501
BA
504
BA
502
505
DECIDE SCENARIO
UPDATE BUL
503
506
SET IP in IP
507
CREATE OR UPDATE
TRANSLATION ENTRY
509
Dst =CoA
Src =HA
Dst =HoA
Src =CN
Payload
508
DECAPSULATION
510
IPv4 -IPv6 TRANSLATION
511
Dst =HoAv4
Src =CNv4
Payload
512
Payload
Src =HoAv4
Dst =CNv4
513
IPv4 -IPv6 TRANSLATION
514
ENCAPSULATION
515
516
Payload
Src =CN
Dst =HoA
Src =CoA
Dst =HA
517

FIG. 10

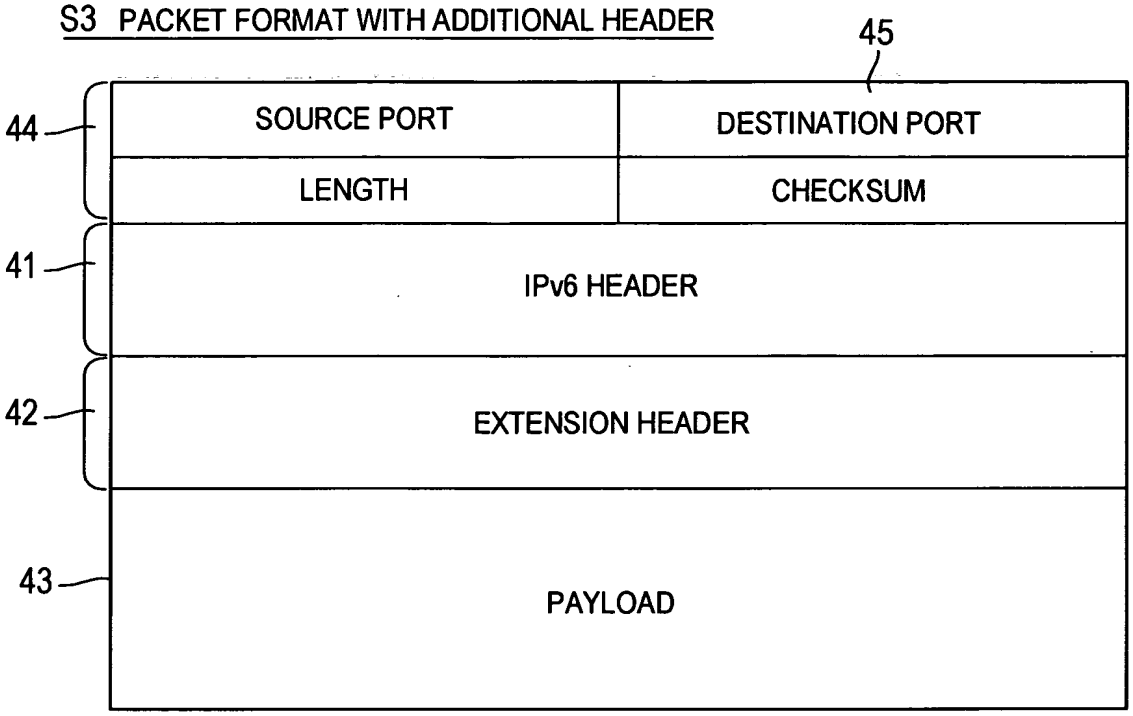
S3 PACKET FORMAT WITH ADDITIONAL HEADER
45
44
SOURCE PORT
DESTINATION PORT
LENGTH
CHECKSUM
41
IPv6 HEADER
42
EXTENSION HEADER
43
PAYLOAD

FIG. 11

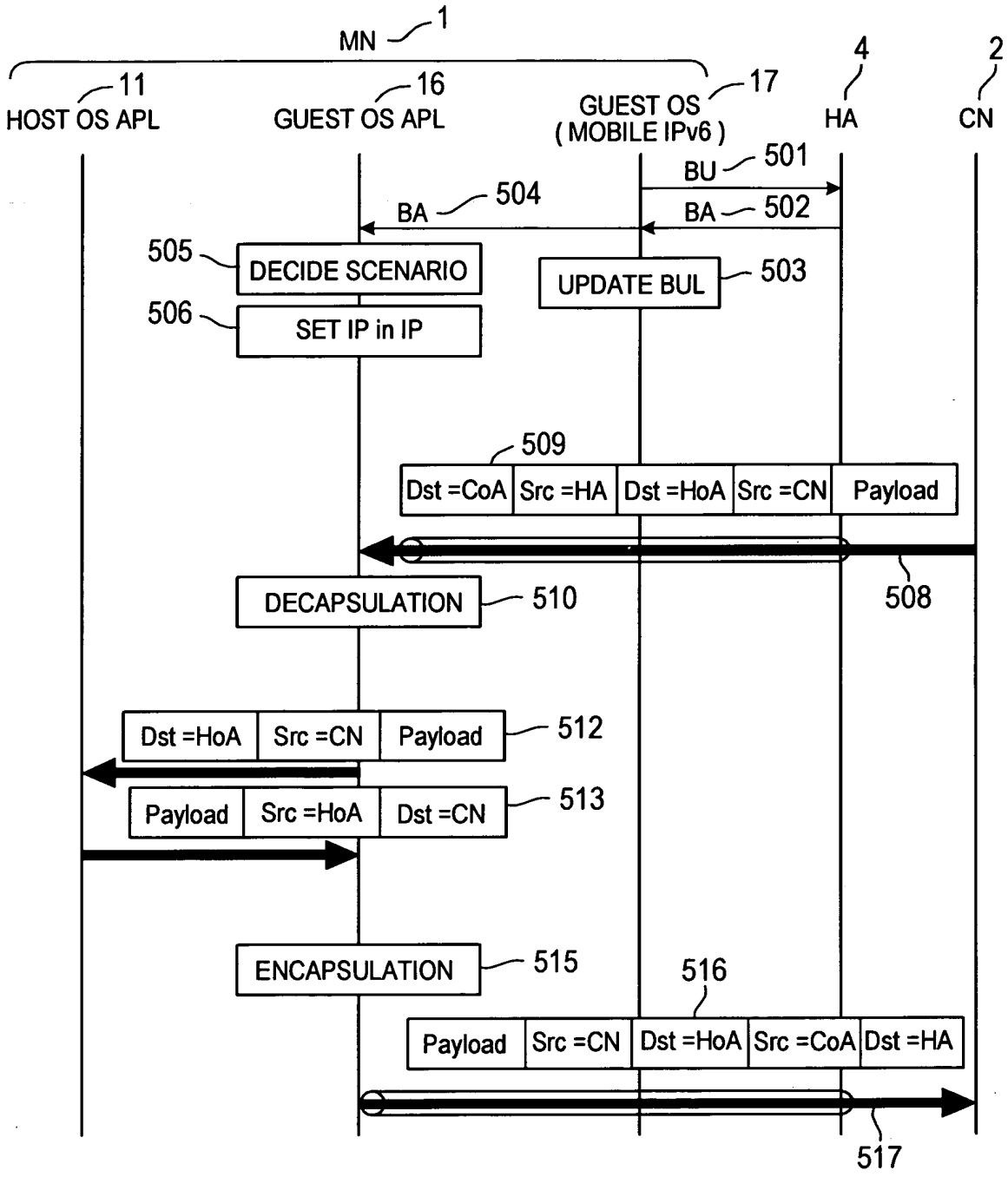
MN
1
11
HOST OS APL
16
GUEST OS APL
17
GUEST OS
(MOBILE IPv6)
4
HA
2
CN
BU
501
BA
504
BA
502
505
DECIDE SCENARIO
UPDATE BUL
503
506
SET IP in IP
509
Dst =CoA
Src =HA
Dst =HoA
Src =CN
Payload
508
DECAPSULATION
510
Dst =HoA
Src =CN
Payload
512
Payload
Src =HoA
Dst =CN
513
ENCAPSULATION
515
516
Payload
Src =CN
Dst =HoA
Src =CoA
Dst =HA
517

FIG. 12

70 BA PROCESSING ROUTINE (MIPv6 PRESSING PART)

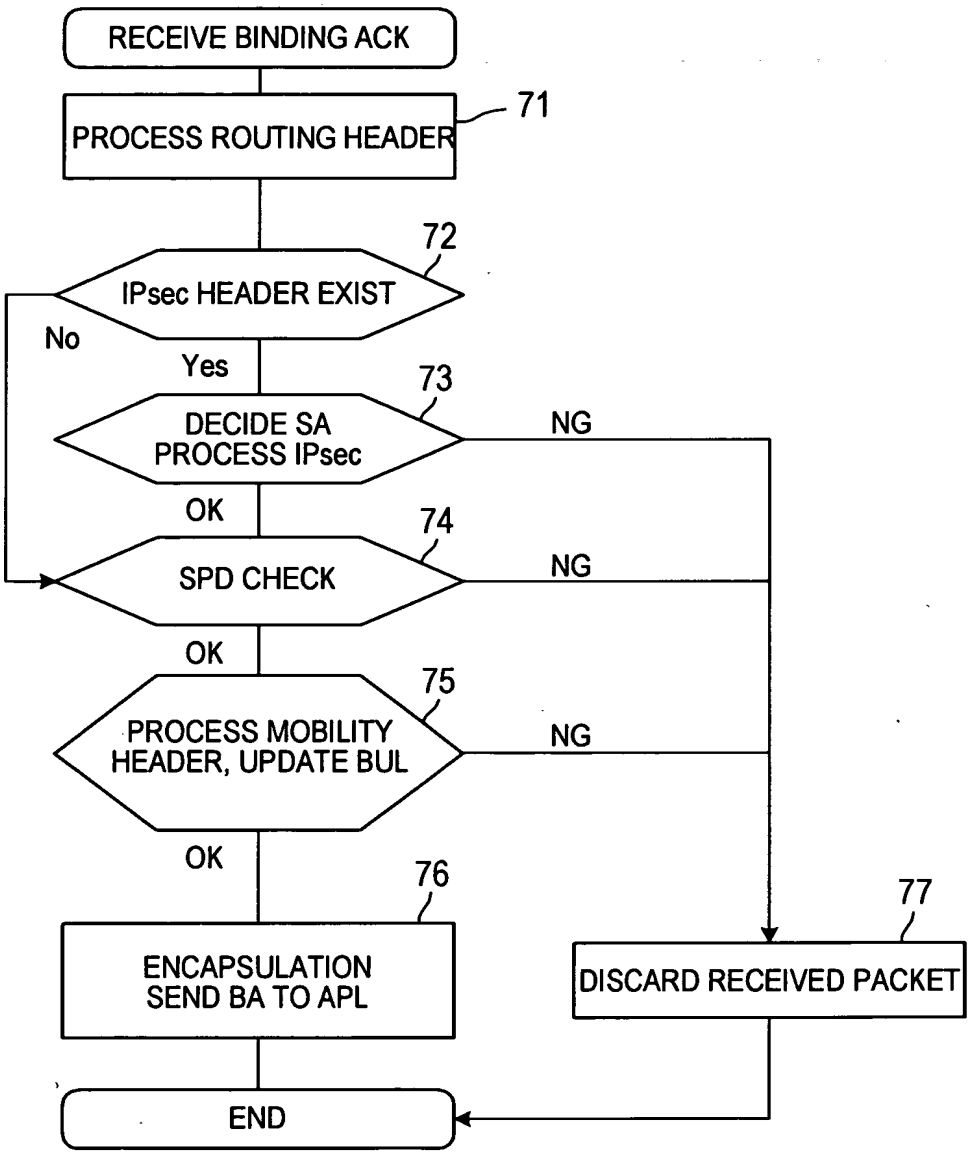

FIG. 13

S2 BINDING ACKNOWLEDGEMENT MESSAGE FORMAT

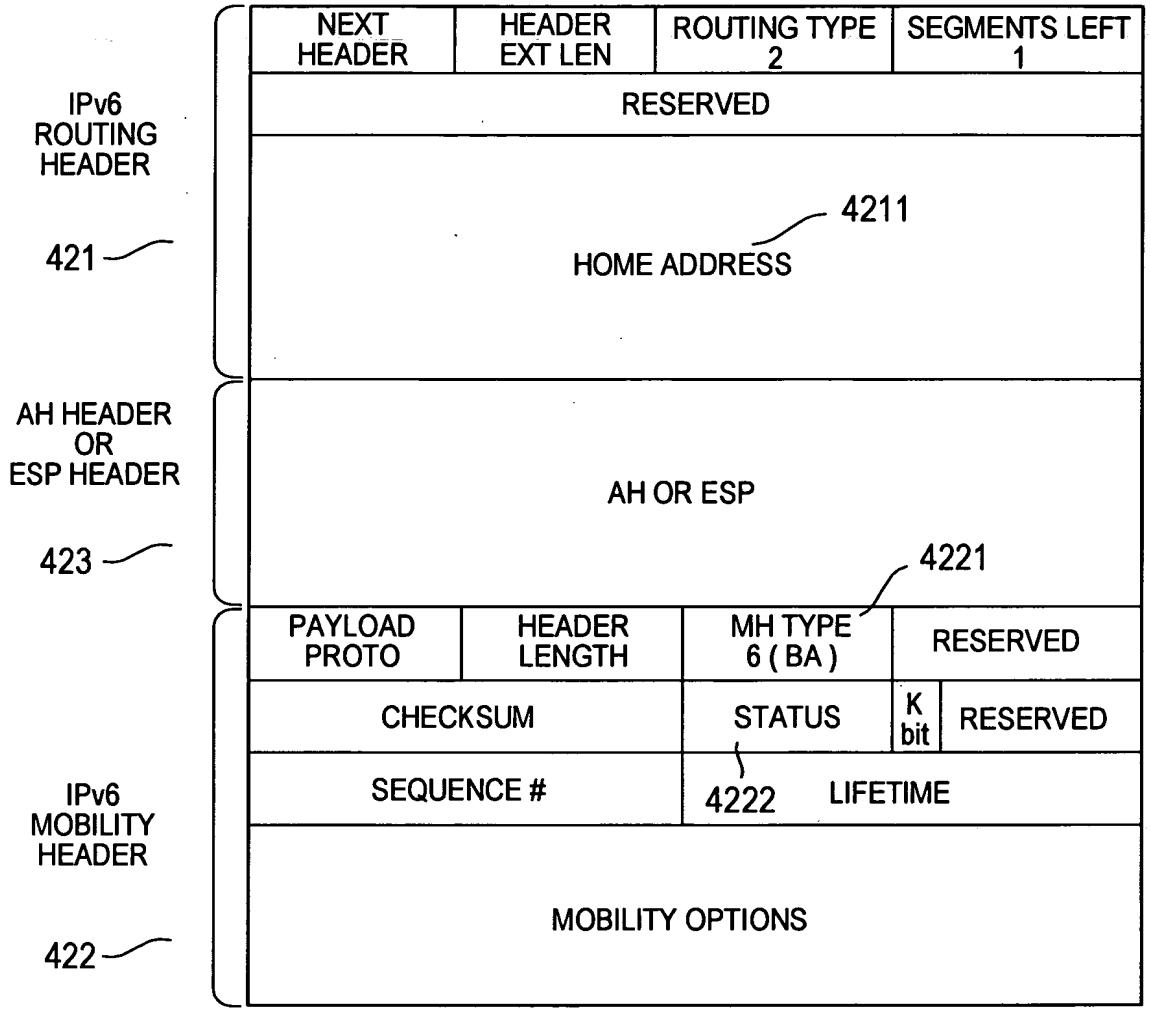

FIG. 14

60 BA PROCESSING ROUTINE

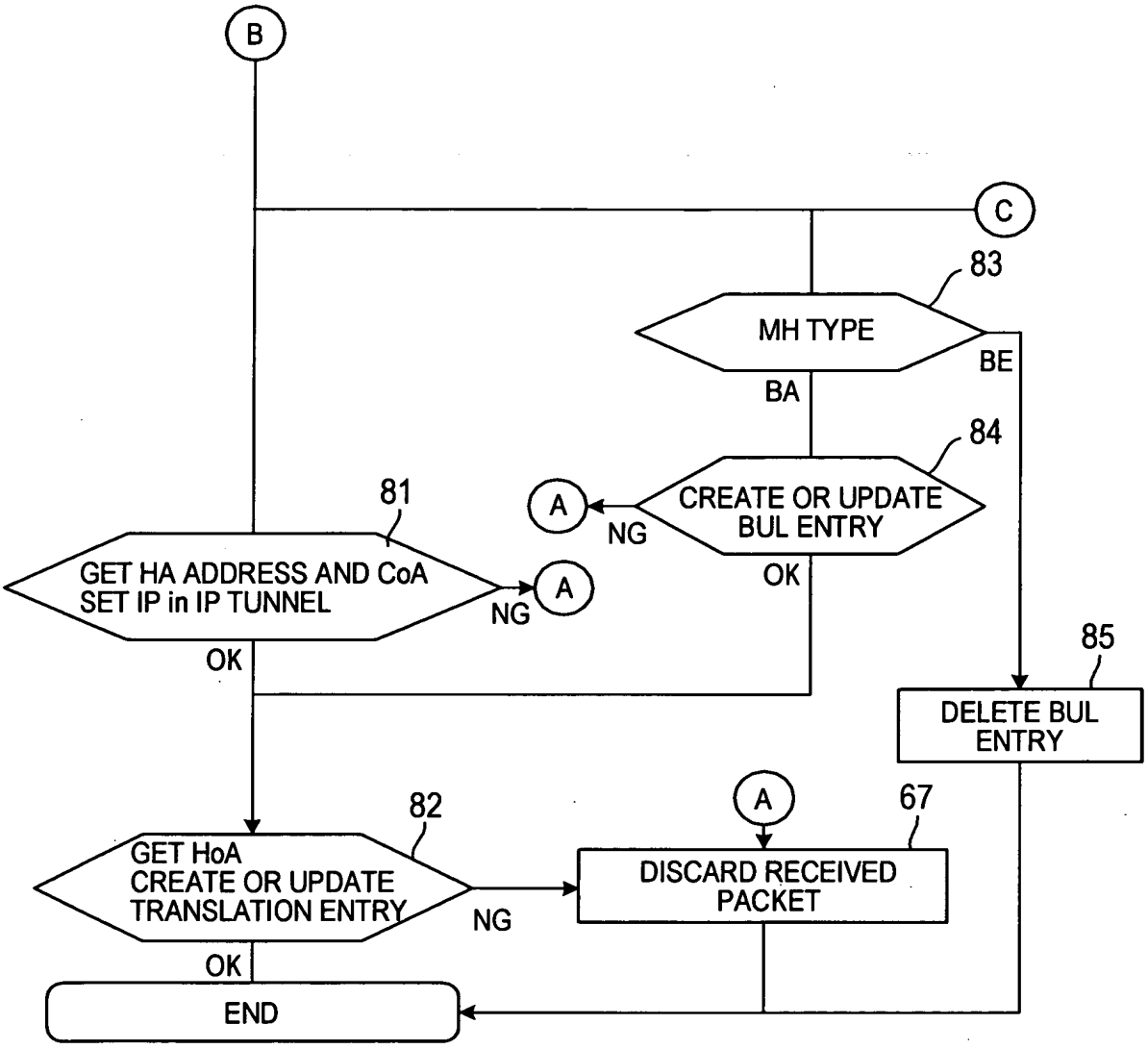

FIG. 15

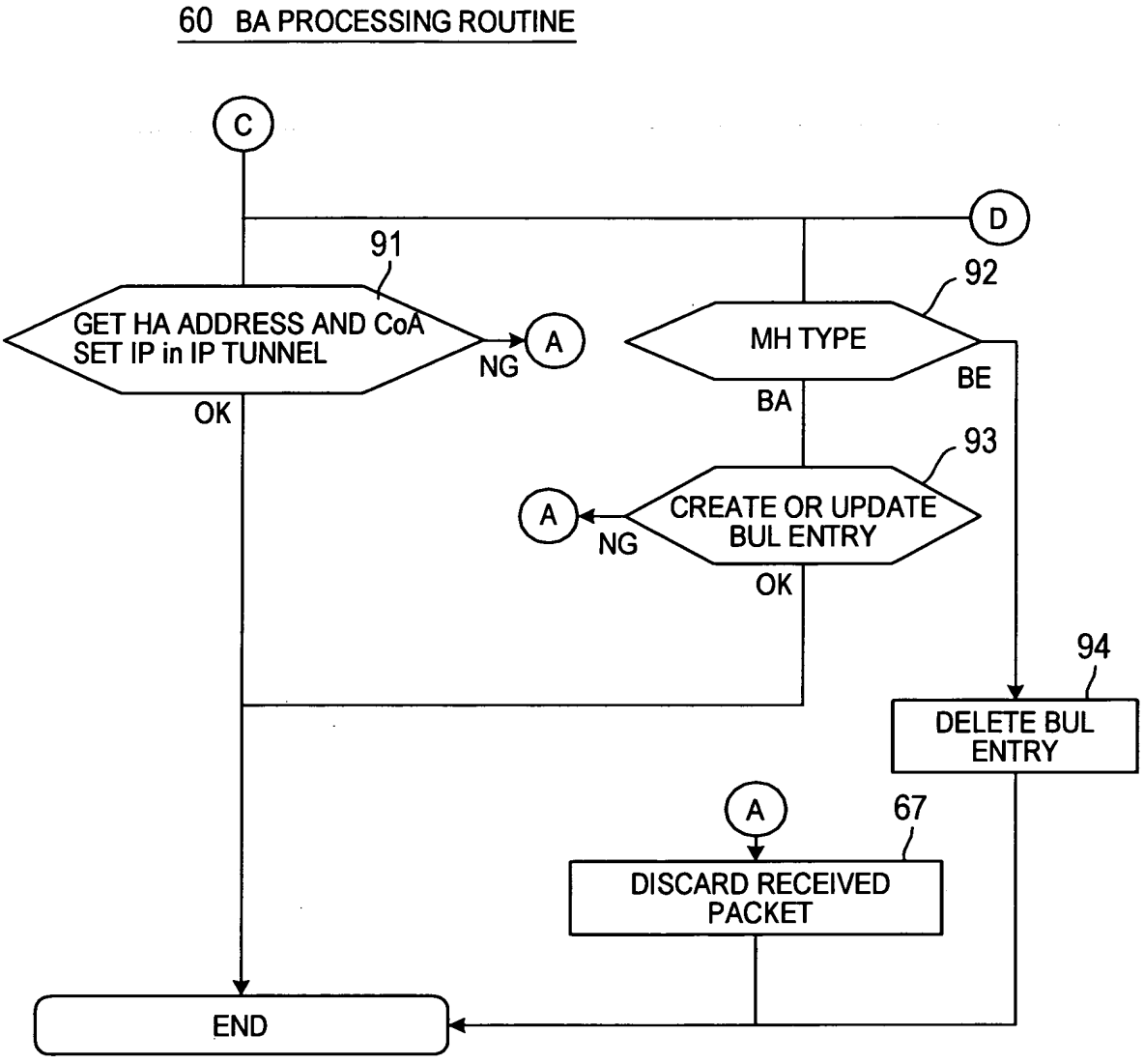
60 BA PROCESSING ROUTINE
C
D
91
GET HA ADDRESS AND CoA
SET IP in IP TUNNEL
NG
A
OK
92
MH TYPE
BE
BA
93
A
NG
CREATE OR UPDATE
BUL ENTRY
OK
94
DELETE BUL
ENTRY
A
67
DISCARD RECEIVED
PACKET
END

FIG. 16

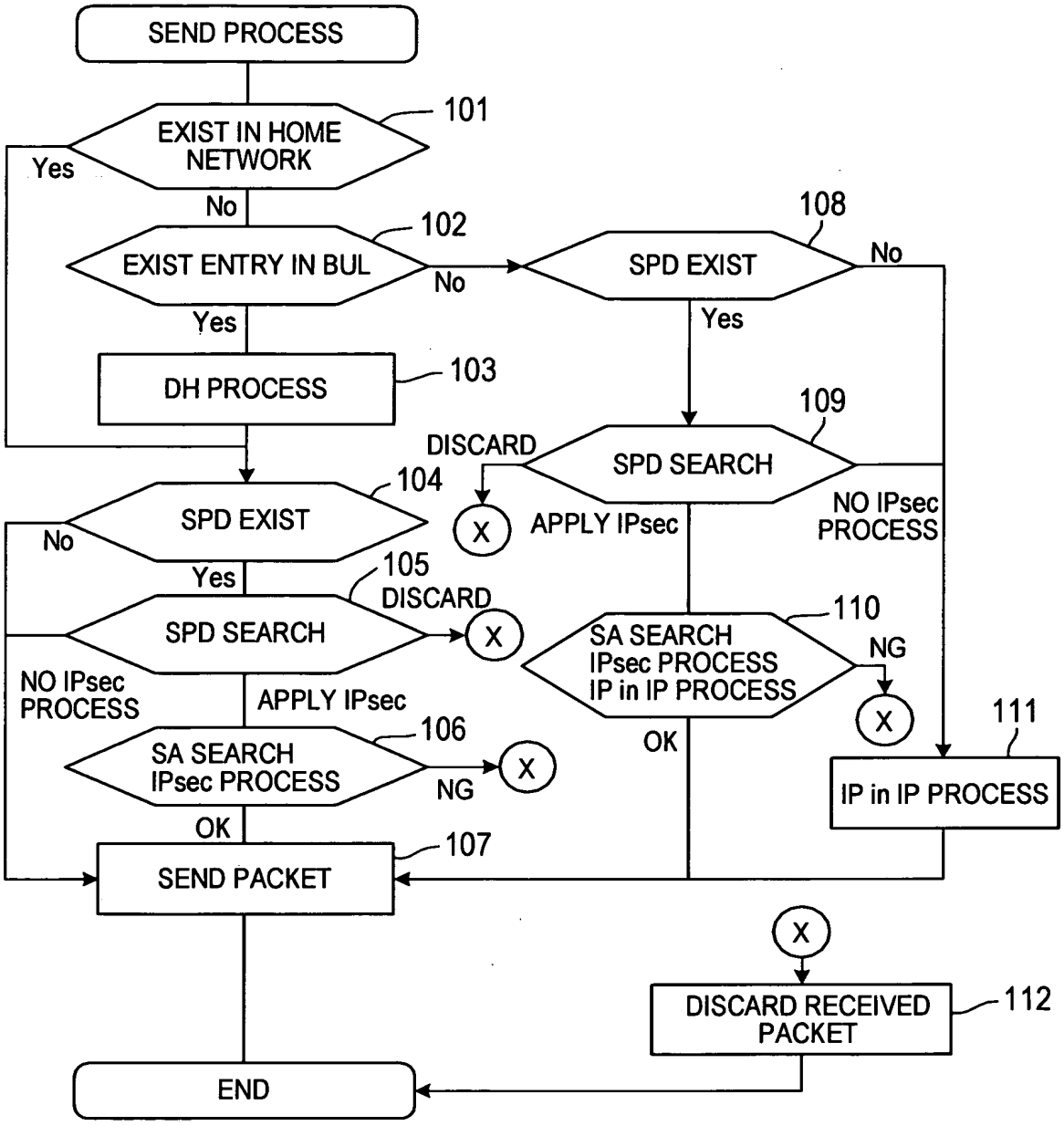
100 PACKET SEND PROCESSING ROUTINE (GUEST OS APL)
SEND PROCESS
EXIST IN HOME NETWORK
101
Yes
No
EXIST ENTRY IN BUL
102
No
Yes
DH PROCESS
103
SPD EXIST
104
No
Yes
SPD SEARCH
105
DISCARD
NO IPsec PROCESS
APPLY IPsec
SA SEARCH IPsec PROCESS
106
NG
OK
SEND PACKET
107
SPD EXIST
108
No
Yes
SPD SEARCH
109
DISCARD
APPLY IPsec
NO IPsec PROCESS
SA SEARCH IPsec PROCESS IP in IP PROCESS
110
NG
OK
IP in IP PROCESS
111
X
DISCARD RECEIVED PACKET
112
END

FIG. 17

120 PACKET RECEIVE PROCESSING ROUTINE (GUEST OS APL)

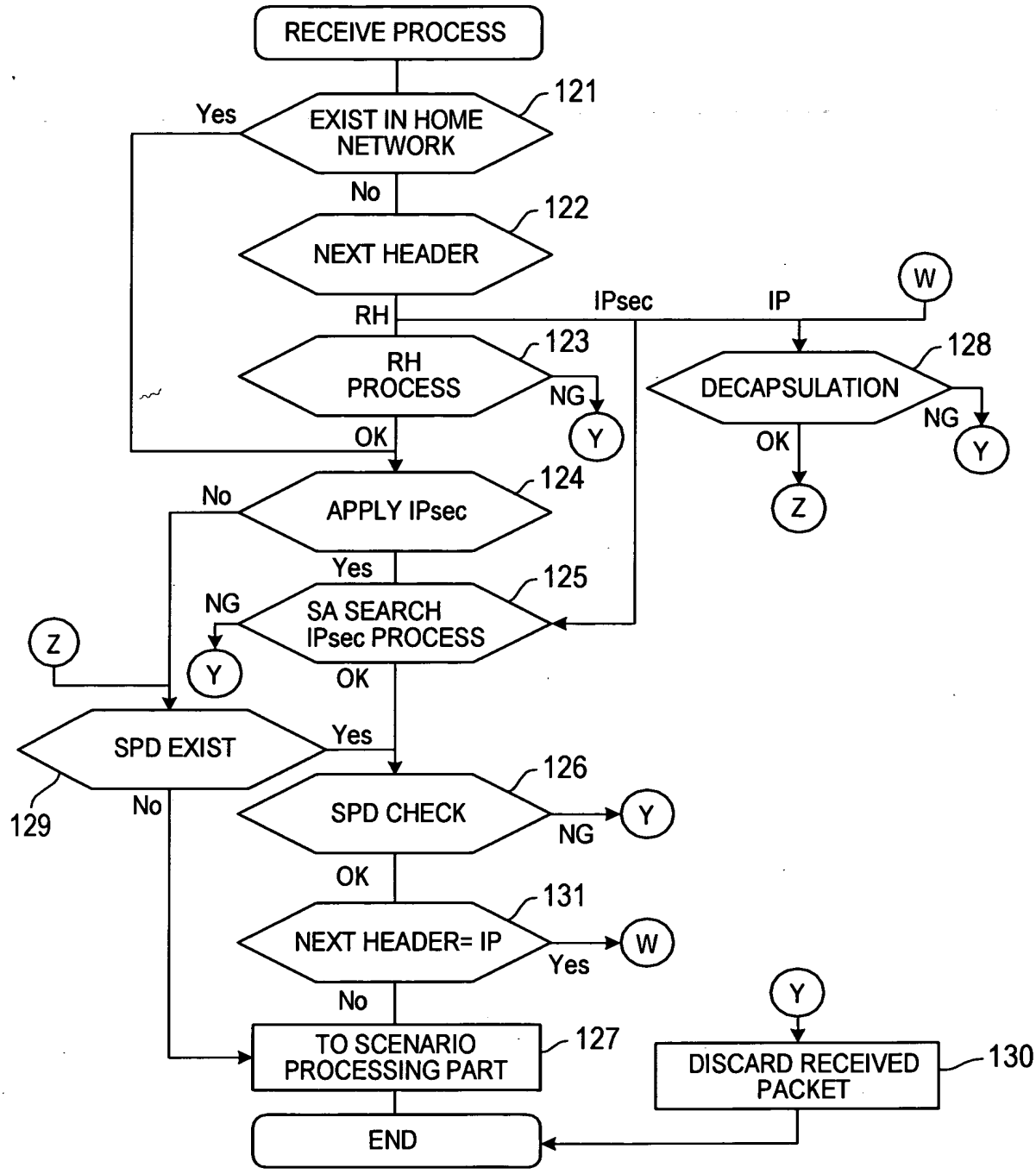

FIG. 18

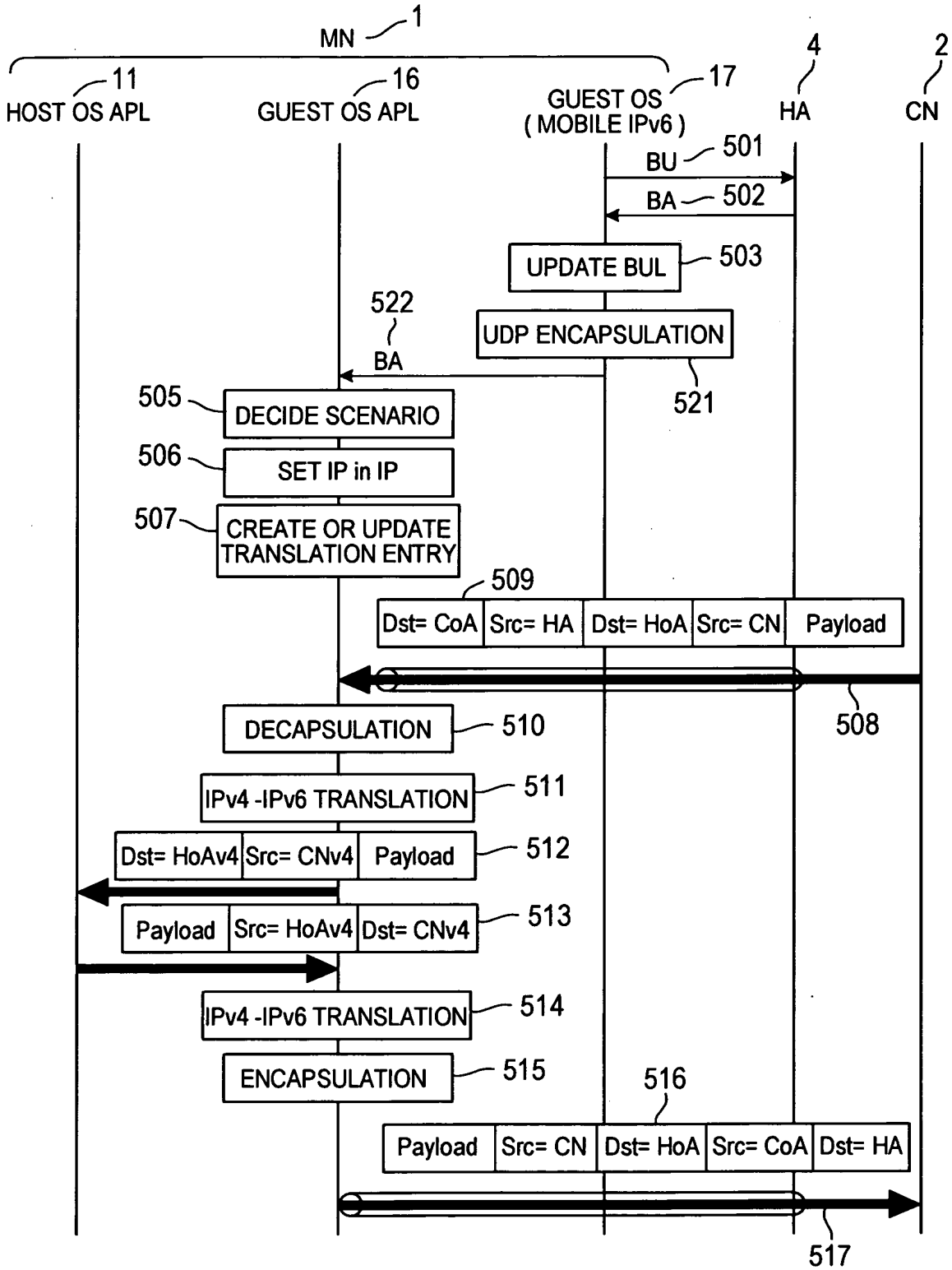
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
CN
2
BU
501
BA
502
UPDATE BUL
503
522
BA
UDP ENCAPSULATION
521
505
DECIDE SCENARIO
506
SET IP in IP
507
CREATE OR UPDATE
TRANSLATION ENTRY
509
Dst= CoA
Src= HA
Dst= HoA
Src= CN
Payload
508
DECAPSULATION
510
IPv4 -IPv6 TRANSLATION
511
Dst= HoAv4
Src= CNv4
Payload
512
Payload
Src= HoAv4
Dst= CNv4
513
IPv4 -IPv6 TRANSLATION
514
ENCAPSULATION
515
516
Payload
Src= CN
Dst= HoA
Src= CoA
Dst= HA
517

FIG. 19

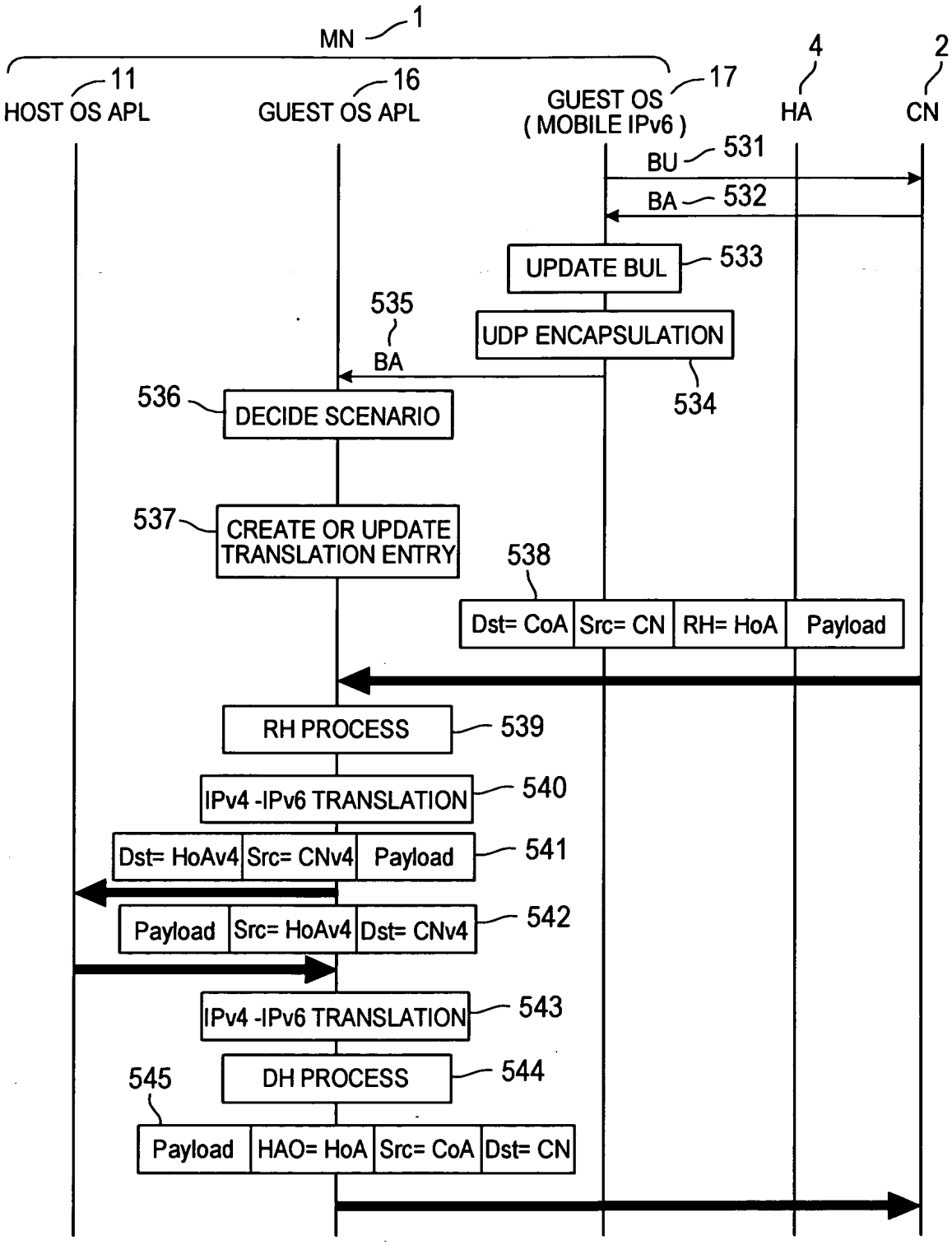
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
CN
2
BU
531
BA
532
UPDATE BUL
533
535
BA
UDP ENCAPSULATION
534
536
DECIDE SCENARIO
537
CREATE OR UPDATE
TRANSLATION ENTRY
538
Dst= CoA
Src= CN
RH= HoA
Payload
RH PROCESS
539
IPv4 -IPv6 TRANSLATION
540
Dst= HoAv4
Src= CNv4
Payload
541
Payload
Src= HoAv4
Dst= CNv4
542
IPv4 -IPv6 TRANSLATION
543
545
DH PROCESS
544
Payload
HAO= HoA
Src= CoA
Dst= CN

FIG. 20

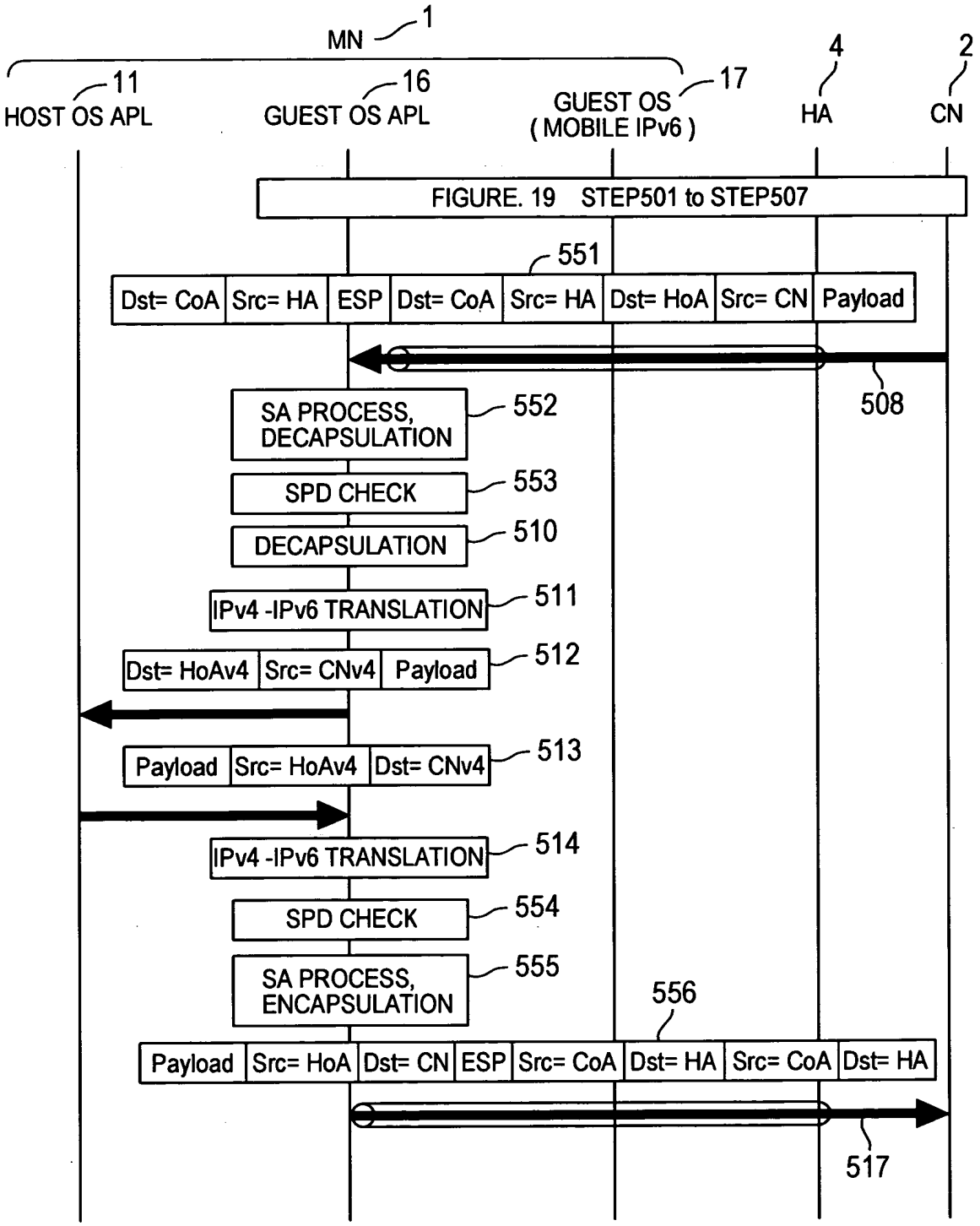
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
CN
2
FIGURE. 19 STEP501 to STEP507
551
Dst= CoA
Src= HA
ESP
Dst= CoA
Src= HA
Dst= HoA
Src= CN
Payload
508
SA PROCESS, DECAPSULATION
552
SPD CHECK
553
DECAPSULATION
510
IPv4 -IPv6 TRANSLATION
511
Dst= HoAv4
Src= CNv4
Payload
512
Payload
Src= HoAv4
Dst= CNv4
513
IPv4 -IPv6 TRANSLATION
514
SPD CHECK
554
SA PROCESS, ENCAPSULATION
555
556
Payload
Src= HoA
Dst= CN
ESP
Src= CoA
Dst= HA
Src= CoA
Dst= HA
517

FIG. 21

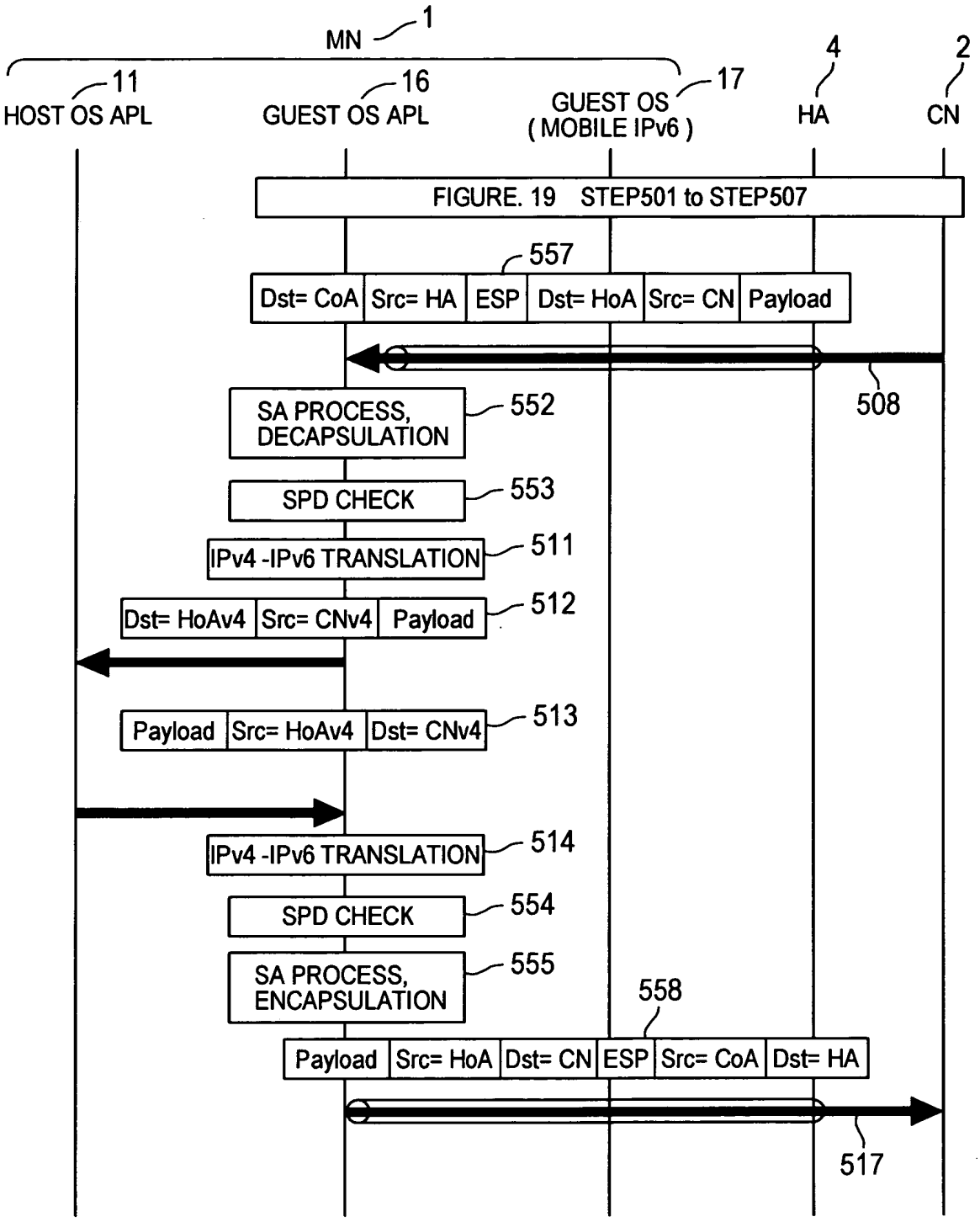
MN
1
11
HOST OS APL
16
GUEST OS APL
17
GUEST OS
(MOBILE IPv6)
4
HA
2
CN
FIGURE. 19 STEP501 to STEP507
557
Dst= CoA
Src= HA
ESP
Dst= HoA
Src= CN
Payload
508
SA PROCESS,
DECAPSULATION
552
SPD CHECK
553
IPv4 -IPv6 TRANSLATION
511
Dst= HoAv4
Src= CNv4
Payload
512
Payload
Src= HoAv4
Dst= CNv4
513
IPv4 -IPv6 TRANSLATION
514
SPD CHECK
554
SA PROCESS,
ENCAPSULATION
555
558
Payload
Src= HoA
Dst= CN
ESP
Src= CoA
Dst= HA
517

FIG. 22

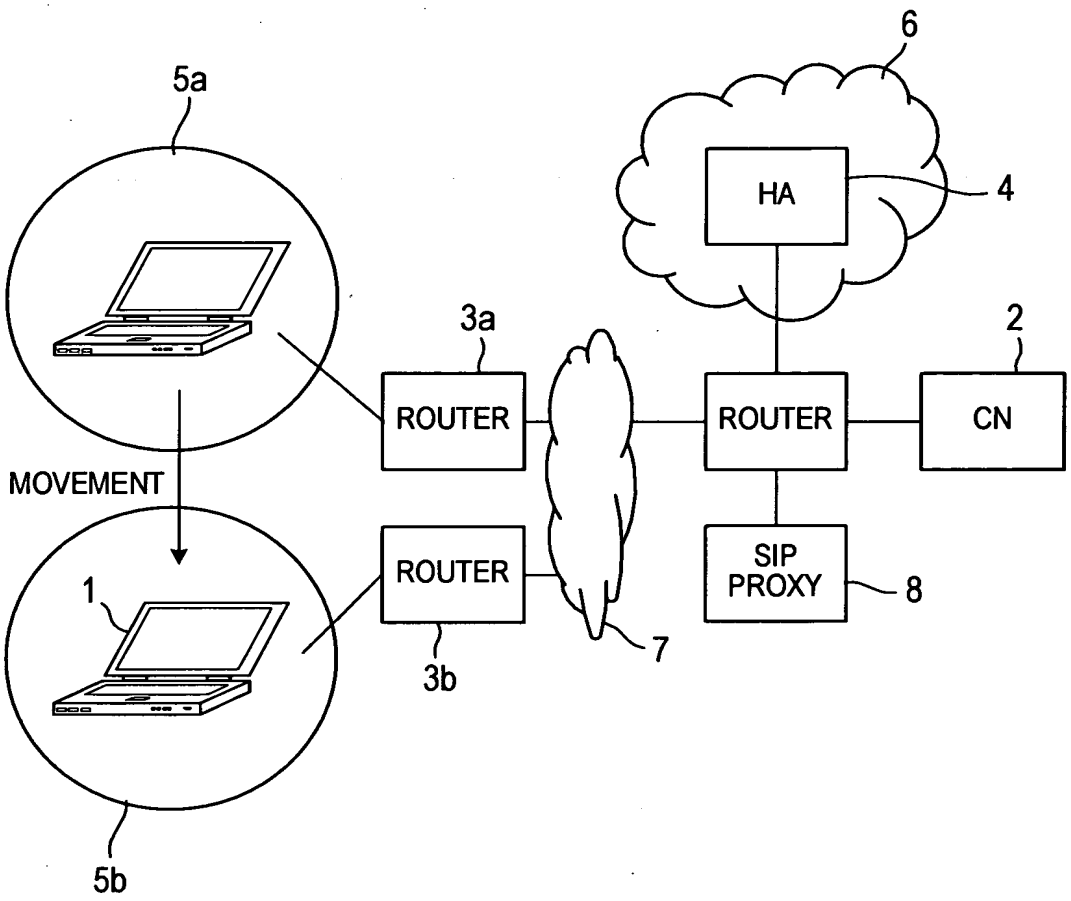
6
5a
HA
4
3a
2
ROUTER
ROUTER
CN
MOVEMENT
ROUTER
SIP
PROXY
8
1
7
3b
5b

FIG. 23

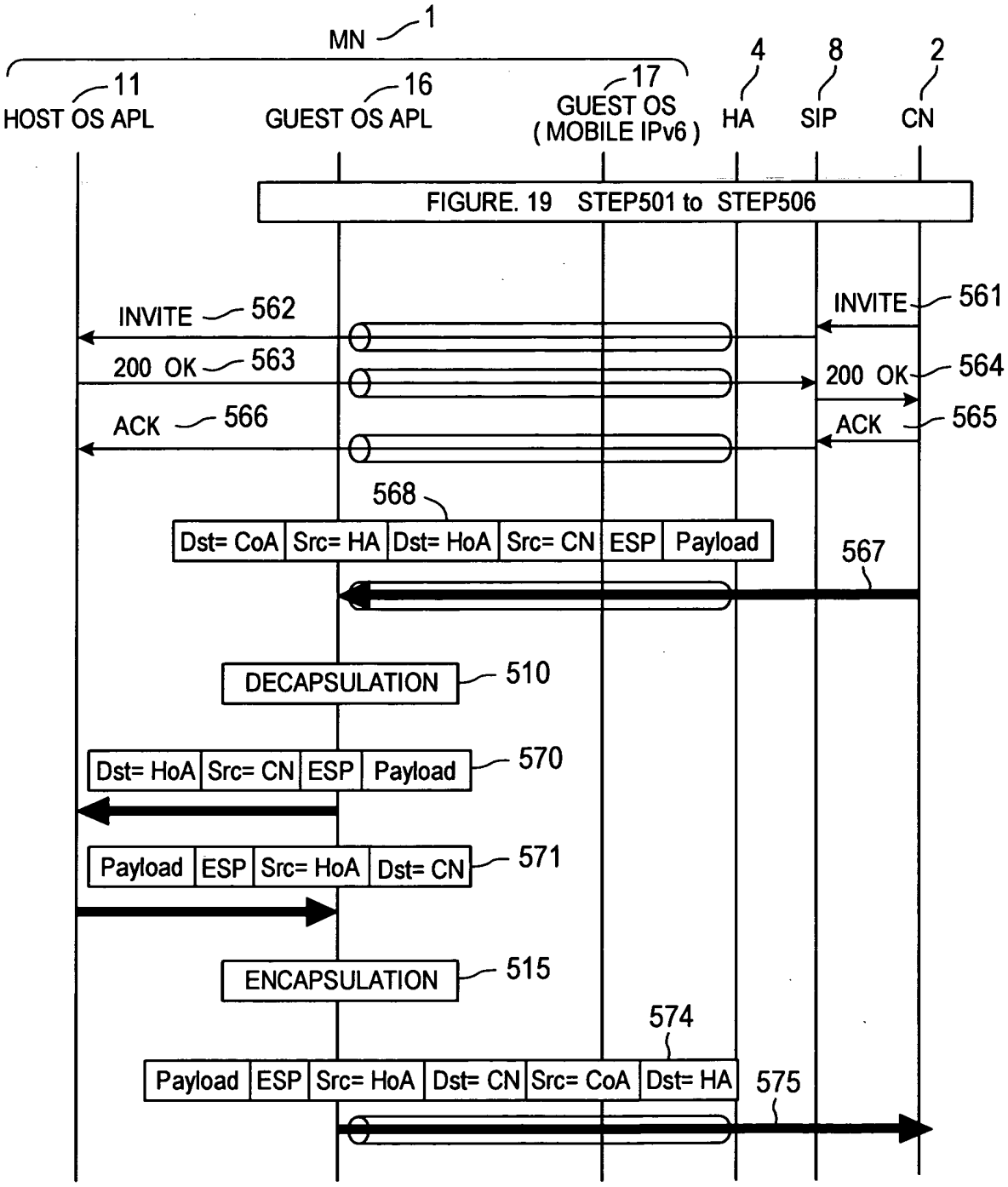
MN
1
11
HOST OS APL
16
GUEST OS APL
17
GUEST OS
(MOBILE IPv6)
4
HA
8
SIP
2
CN
FIGURE. 19 STEP501 to STEP506
INVITE
562
INVITE
561
200 OK
563
200 OK
564
ACK
566
ACK
565
568
Dst= CoA
Src= HA
Dst= HoA
Src= CN
ESP
Payload
567
DECAPSULATION
510
Dst= HoA
Src= CN
ESP
Payload
570
Payload
ESP
Src= HoA
Dst= CN
571
ENCAPSULATION
515
574
Payload
ESP
Src= HoA
Dst= CN
Src= CoA
Dst= HA
575

FIG. 24

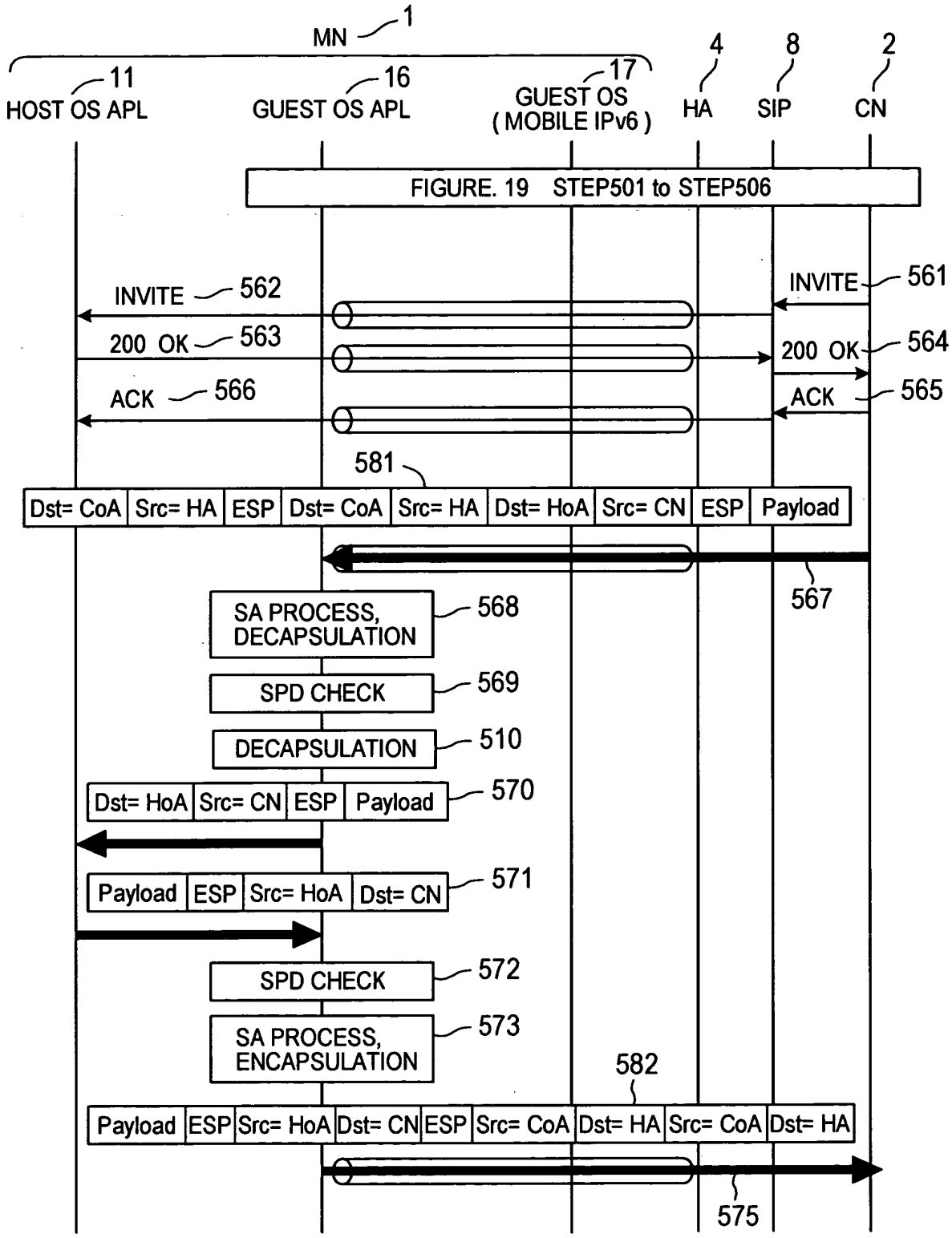
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
SIP
8
CN
2
FIGURE. 19 STEP501 to STEP506
INVITE
562
INVITE
561
200 OK
563
200 OK
564
ACK
566
ACK
565
581
Dst= CoA
Src= HA
ESP
Dst= CoA
Src= HA
Dst= HoA
Src= CN
ESP
Payload
567
SA PROCESS,
DECAPSULATION
568
SPD CHECK
569
DECAPSULATION
510
Dst= HoA
Src= CN
ESP
Payload
570
Payload
ESP
Src= HoA
Dst= CN
571
SPD CHECK
572
SA PROCESS,
ENCAPSULATION
573
582
Payload
ESP
Src= HoA
Dst= CN
ESP
Src= CoA
Dst= HA
Src= CoA
Dst= HA
575

FIG. 25

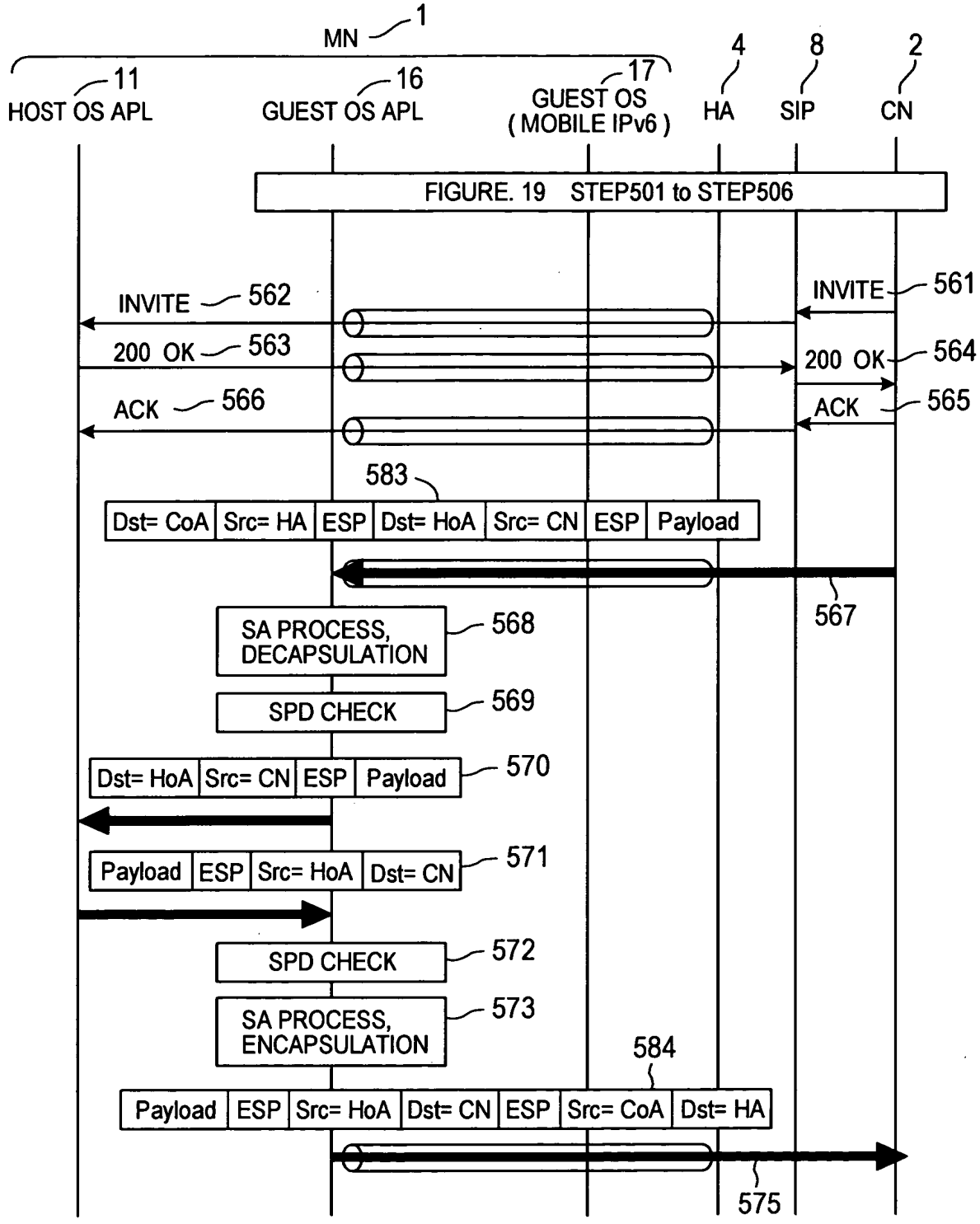
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(MOBILE IPv6)
17
HA
4
SIP
8
CN
2
FIGURE. 19 STEP501 to STEP506
INVITE
562
INVITE
561
200 OK
563
200 OK
564
ACK
566
ACK
565
583
Dst= CoA
Src= HA
ESP
Dst= HoA
Src= CN
ESP
Payload
567
SA PROCESS,
DECAPSULATION
568
SPD CHECK
569
Dst= HoA
Src= CN
ESP
Payload
570
Payload
ESP
Src= HoA
Dst= CN
571
SPD CHECK
572
SA PROCESS,
ENCAPSULATION
573
584
Payload
ESP
Src= HoA
Dst= CN
ESP
Src= CoA
Dst= HA
575

FIG. 26

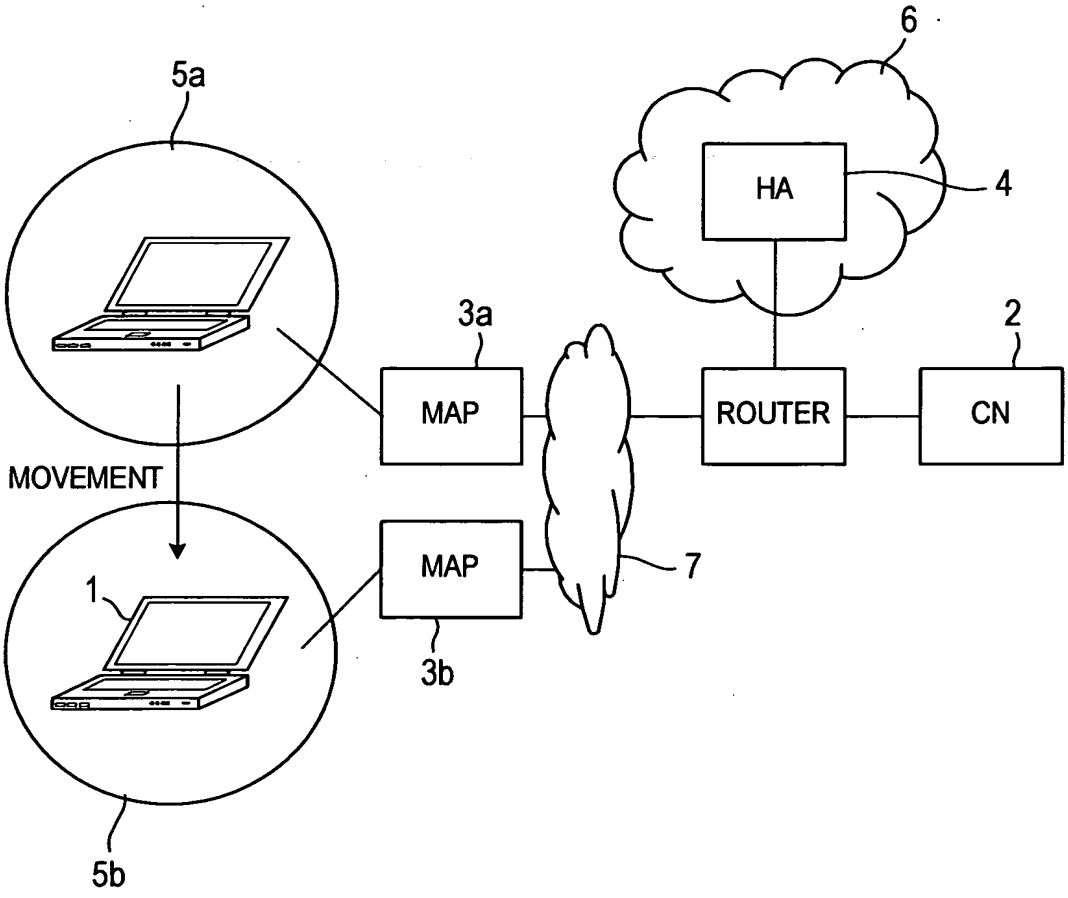

FIG. 27

FUNCTIONAL BLOCK OF A TERMINAL

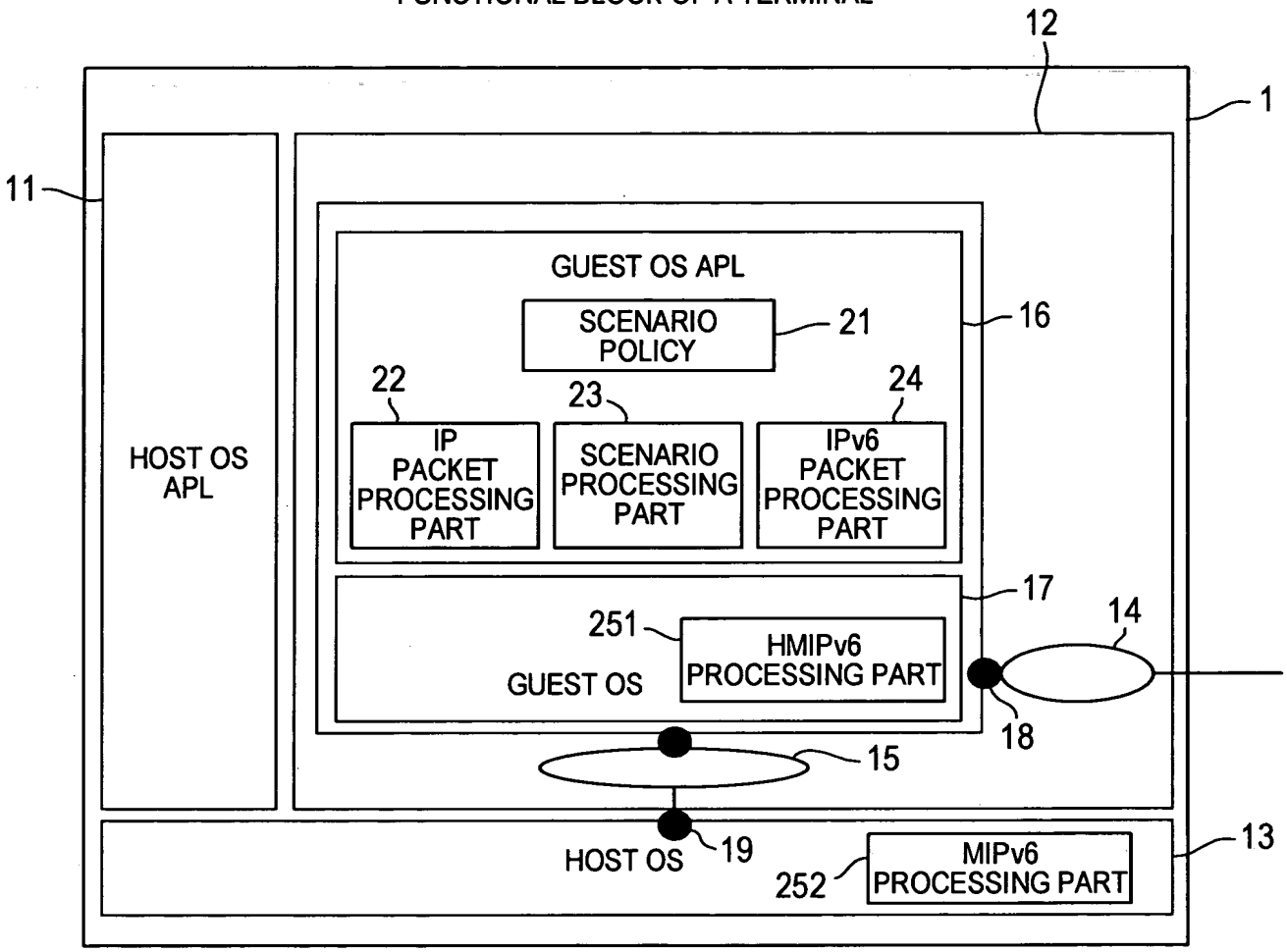

FIG. 28

S4 ROUTER ADVERTISEMENT MESSAGE FORMAT

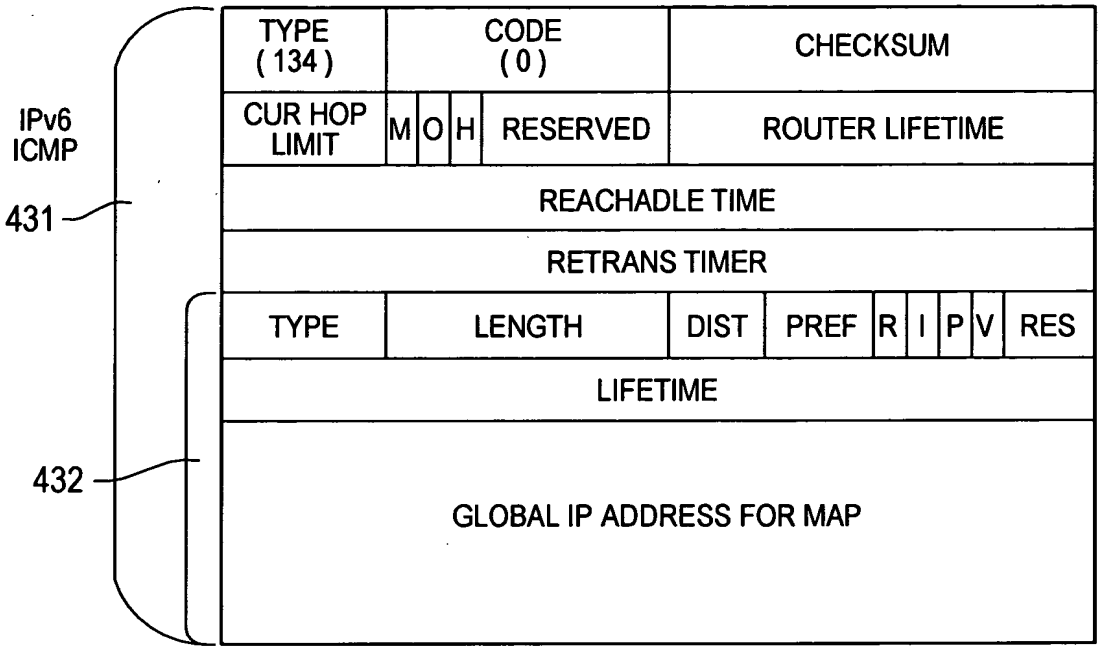

FIG. 29

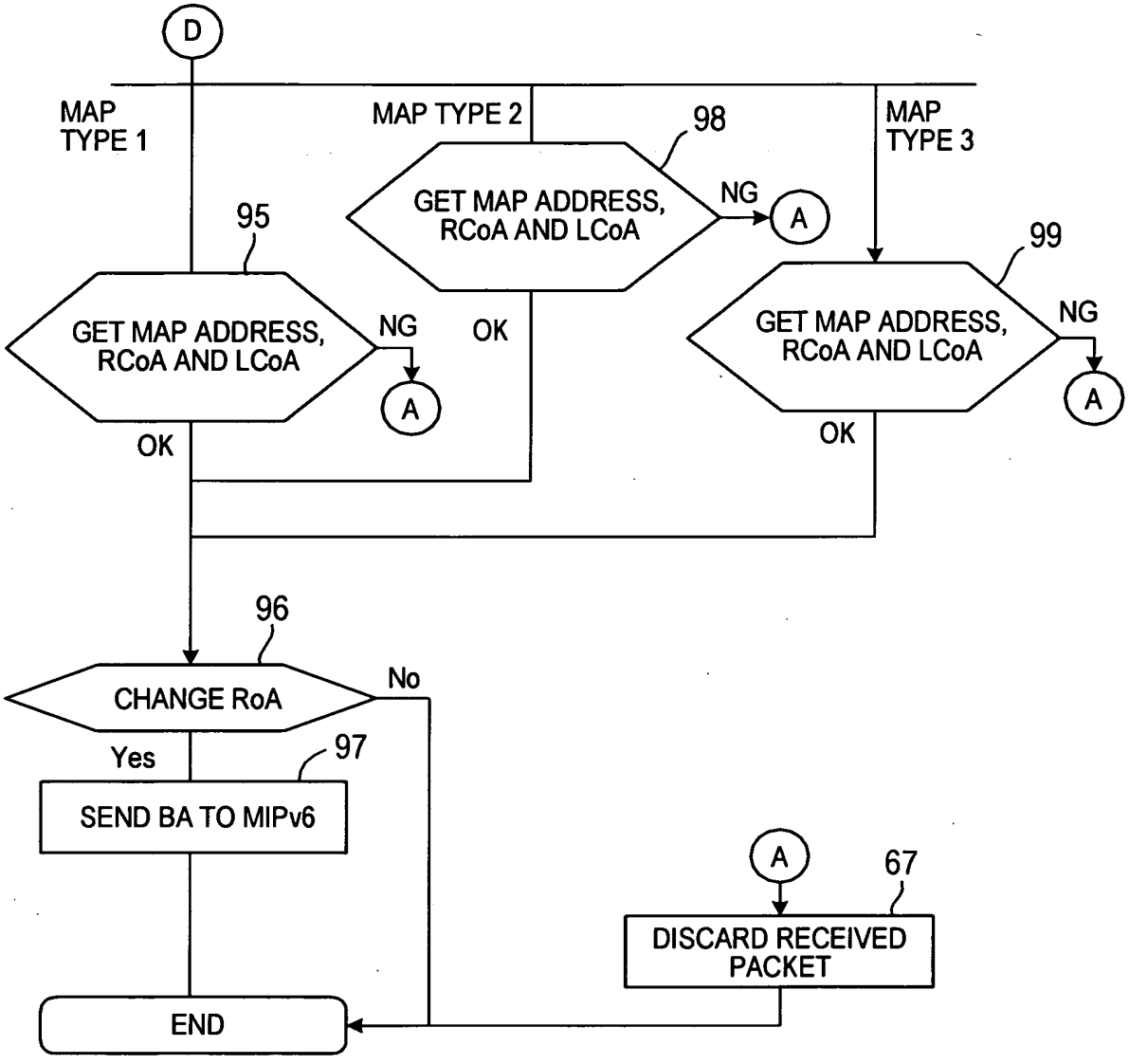
60 BA PROCESSING ROUTINE
D
MAP TYPE 1
MAP TYPE 2
MAP TYPE 3
98
GET MAP ADDRESS, RCoA AND LCoA
NG
A
95
GET MAP ADDRESS, RCoA AND LCoA
NG
OK
A
99
GET MAP ADDRESS, RCoA AND LCoA
NG
A
OK
OK
96
CHANGE RoA
No
Yes
97
SEND BA TO MIPv6
A
67
DISCARD RECEIVED PACKET
END

FIG. 30

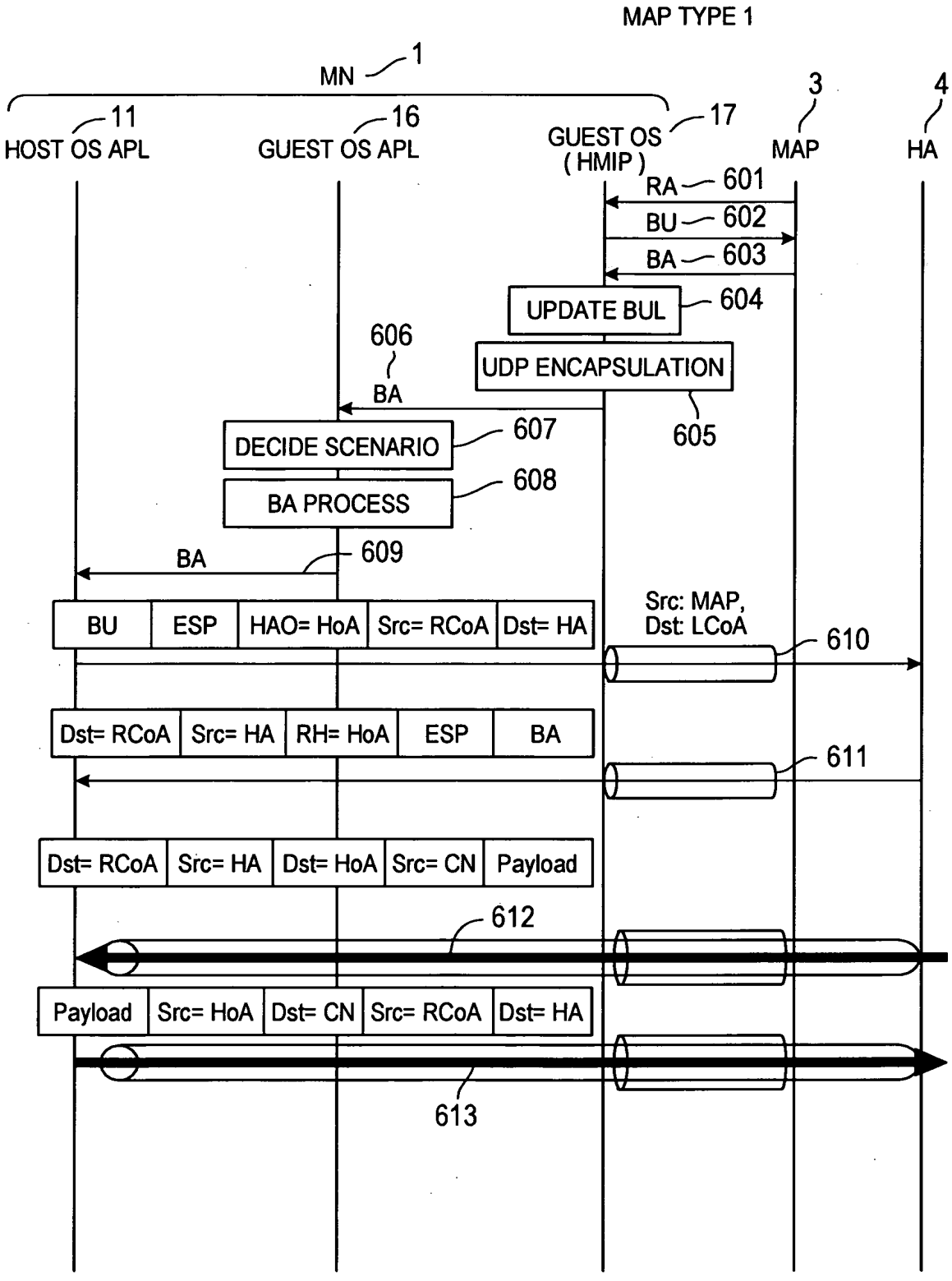
MAP TYPE 1
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(HMIP)
17
MAP
3
HA
4
RA
601
BU
602
BA
603
UPDATE BUL
604
606
BA
UDP ENCAPSULATION
605
DECIDE SCENARIO
607
BA PROCESS
608
BA
609
BU
ESP
HAO= HoA
Src= RCoA
Dst= HA
Src: MAP,
Dst: LCoA
610
Dst= RCoA
Src= HA
RH= HoA
ESP
BA
611
Dst= RCoA
Src= HA
Dst= HoA
Src= CN
Payload
612
Payload
Src= HoA
Dst= CN
Src= RCoA
Dst= HA
613

FIG. 31

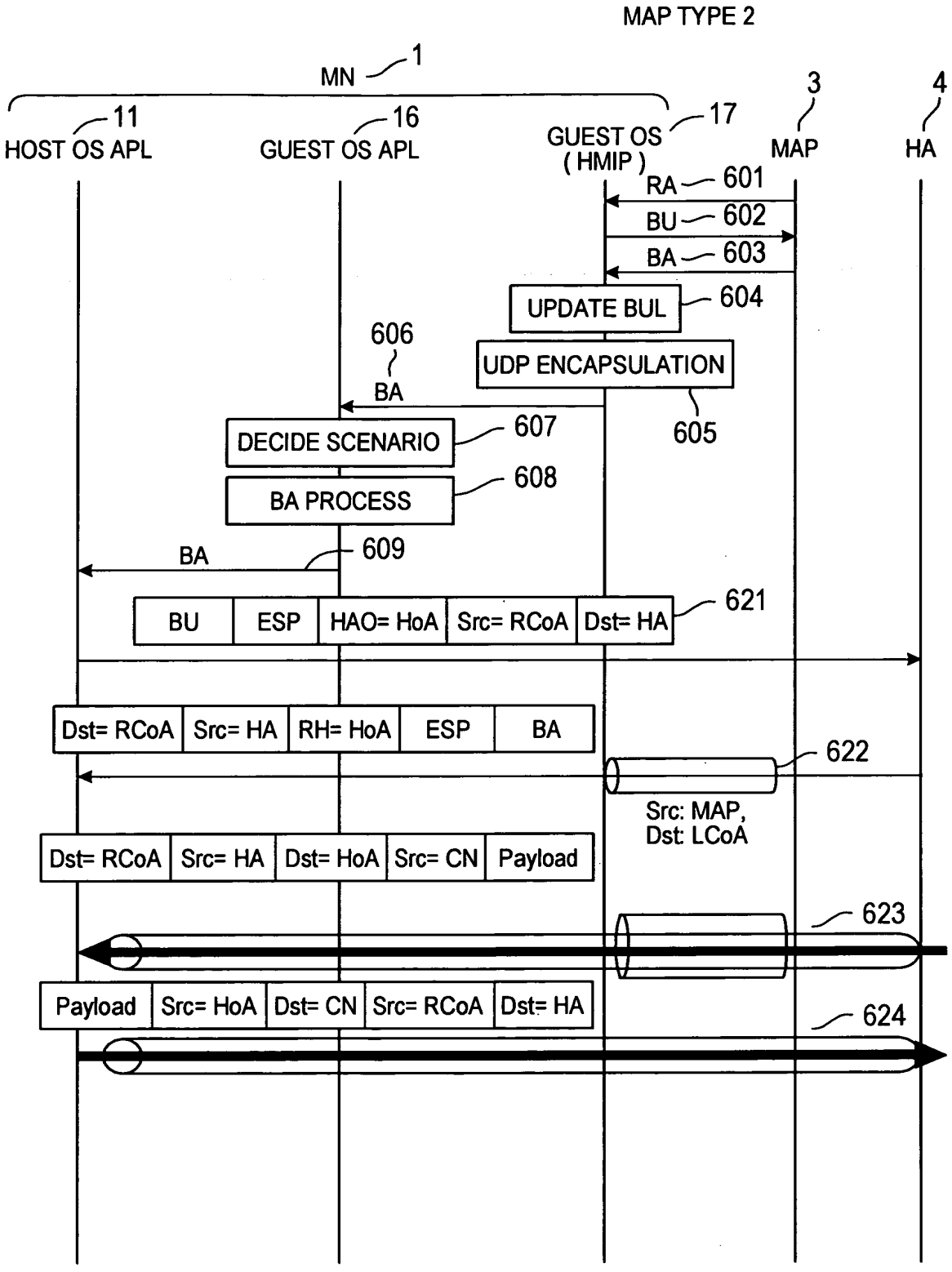
MAP TYPE 2
MN
1
3
4
11
16
17
HOST OS APL
GUEST OS APL
GUEST OS
(HMIP)
MAP
HA
RA
601
BU
602
BA
603
UPDATE BUL
604
606
BA
UDP ENCAPSULATION
605
DECIDE SCENARIO
607
BA PROCESS
608
BA
609
BU
ESP
HAO= HoA
Src= RCoA
Dst= HA
621
Dst= RCoA
Src= HA
RH= HoA
ESP
BA
622
Src: MAP,
Dst: LCoA
Dst= RCoA
Src= HA
Dst= HoA
Src= CN
Payload
623
Payload
Src= HoA
Dst= CN
Src= RCoA
Dst= HA
624

FIG. 32

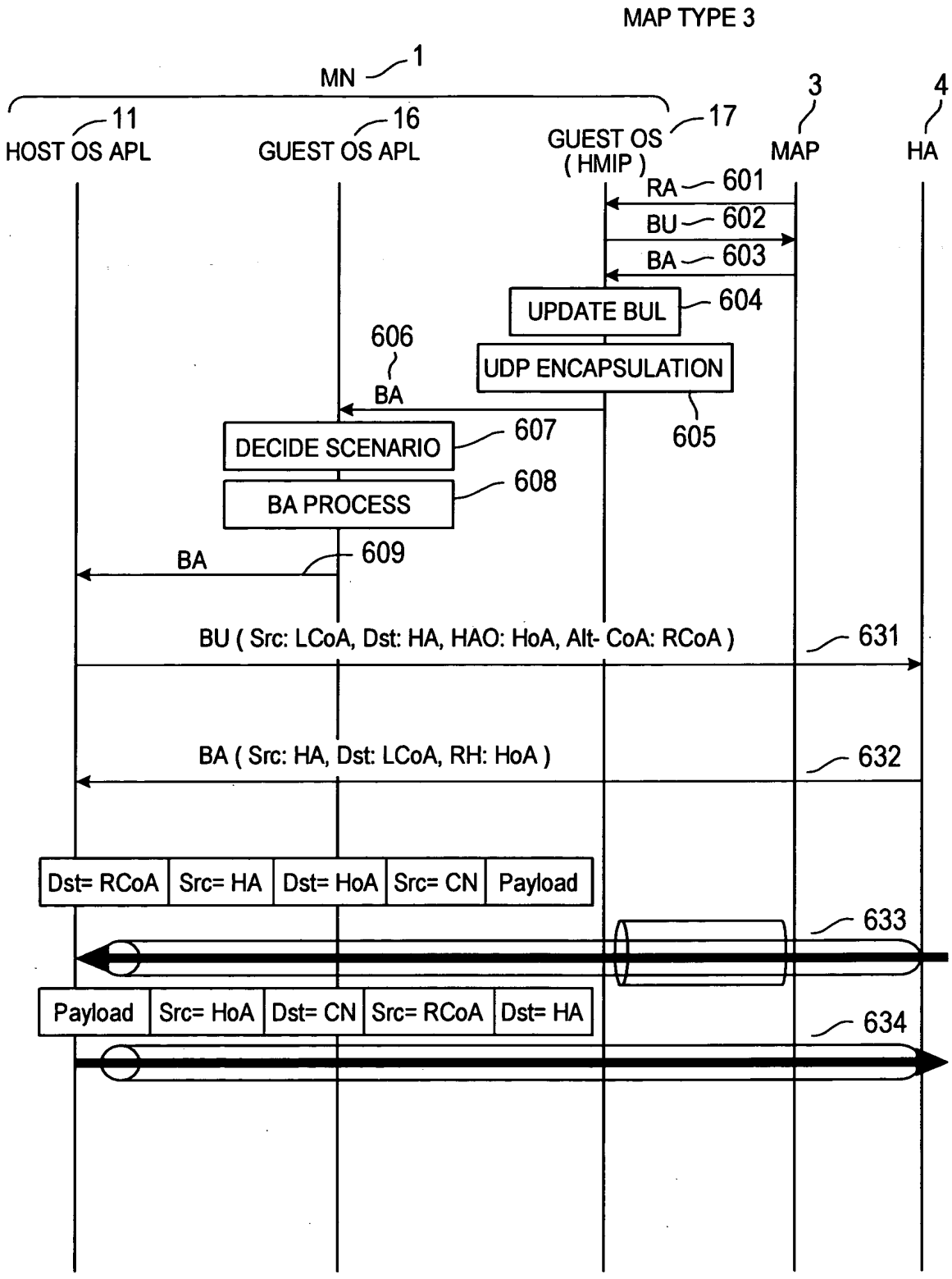
MAP TYPE 3
MN
1
HOST OS APL
11
GUEST OS APL
16
GUEST OS
(HMIP)
17
MAP
3
HA
4
RA
601
BU
602
BA
603
UPDATE BUL
604
606
BA
UDP ENCAPSULATION
605
DECIDE SCENARIO
607
BA PROCESS
608
BA
609
BU (Src: LCoA, Dst: HA, HAO: HoA, Alt- CoA: RCoA)
631
BA (Src: HA, Dst: LCoA, RH: HoA)
632
Dst= RCoA
Src= HA
Dst= HoA
Src= CN
Payload
633
Payload
Src= HoA
Dst= CN
Src= RCoA
Dst= HA
634

FIG. 33

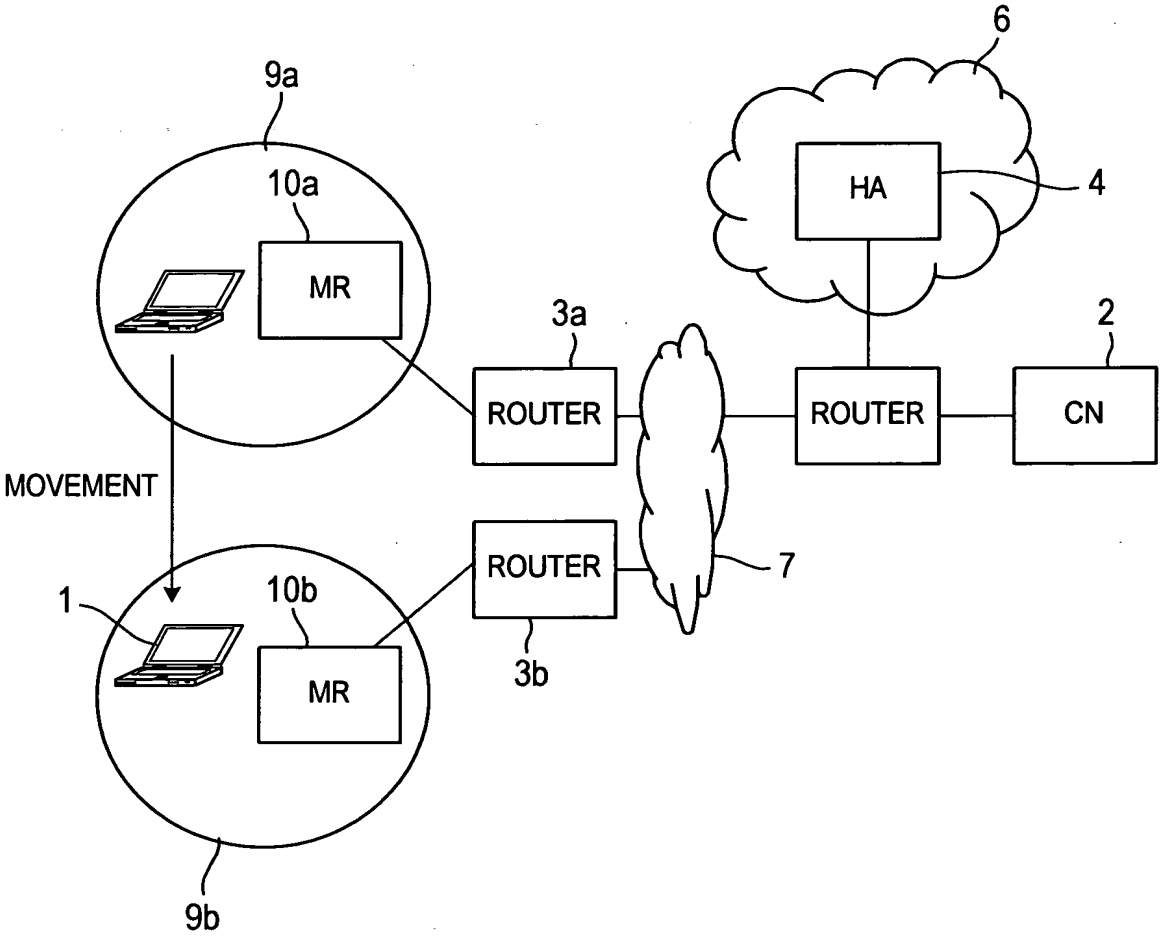
6
9a
10a
HA
4
MR
3a
2
ROUTER
ROUTER
CN
MOVEMENT
ROUTER
7
1
10b
MR
3b
9b

FIG. 34

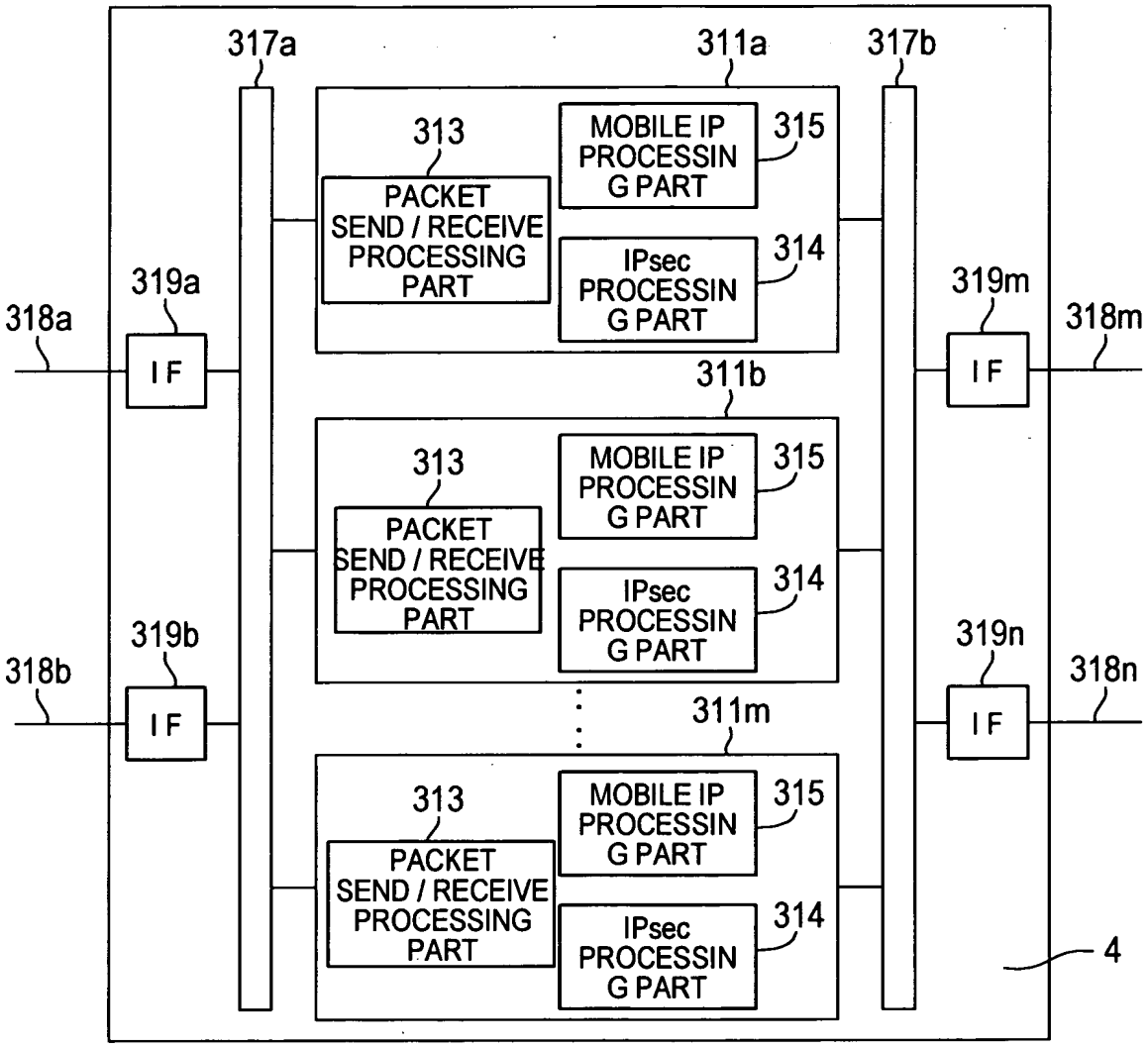
317a
311a
317b
313
MOBILE IP PROCESSIN G PART
315
PACKET SEND / RECEIVE PROCESSING PART
IPsec PROCESSIN G PART
314
319a
319m
318a
318m
I F
311b
319b
319n
318b
318n
311m
4

FIG. 35

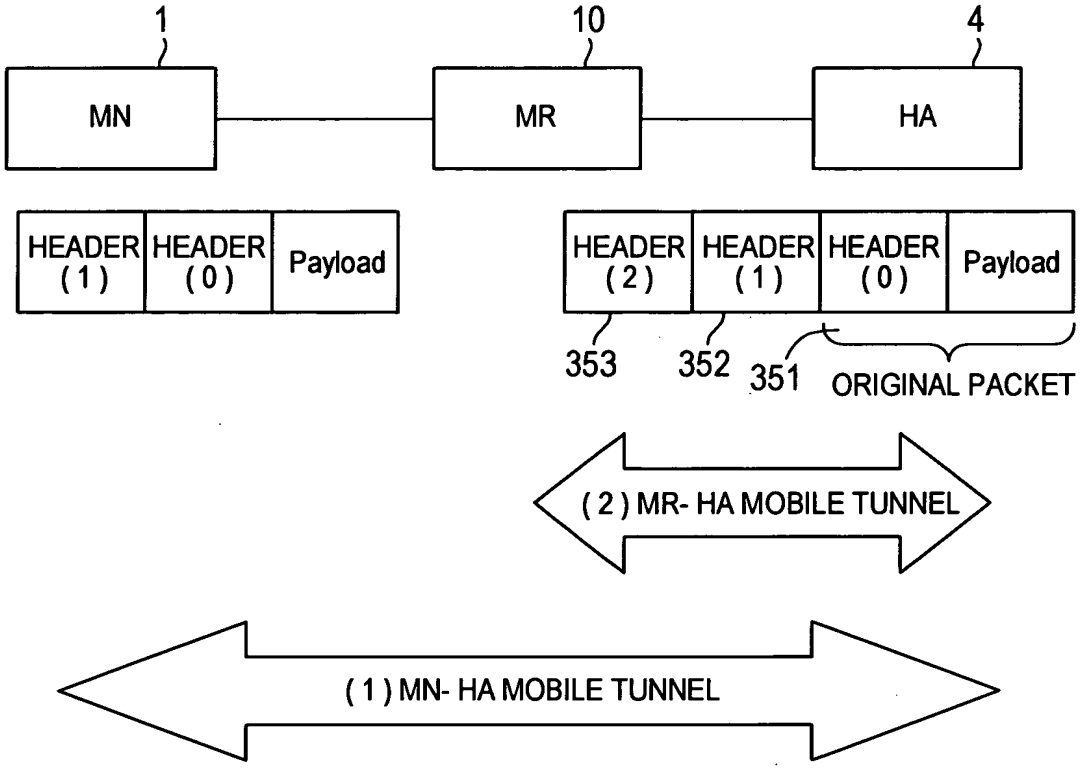
1
10
4
MN
MR
HA
HEADER (1)
HEADER (0)
Payload
HEADER (2)
HEADER (1)
HEADER (0)
Payload
353
352
351
ORIGINAL PACKET
(2) MR- HA MOBILE TUNNEL
(1) MN- HA MOBILE TUNNEL

FIG. 36

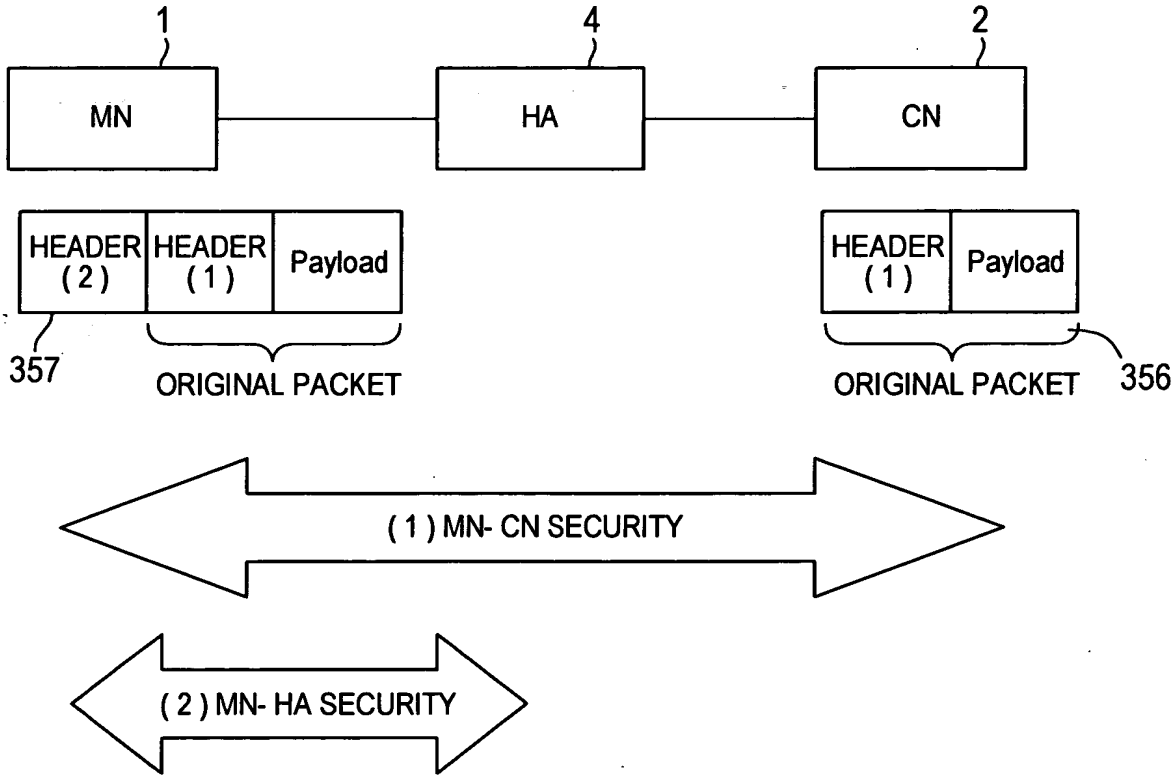
1
4
2
MN
HA
CN
HEADER (2)
HEADER (1)
Payload
HEADER (1)
Payload
357
ORIGINAL PACKET
ORIGINAL PACKET
356
(1) MN- CN SECURITY
(2) MN- HA SECURITY

FIG. 37

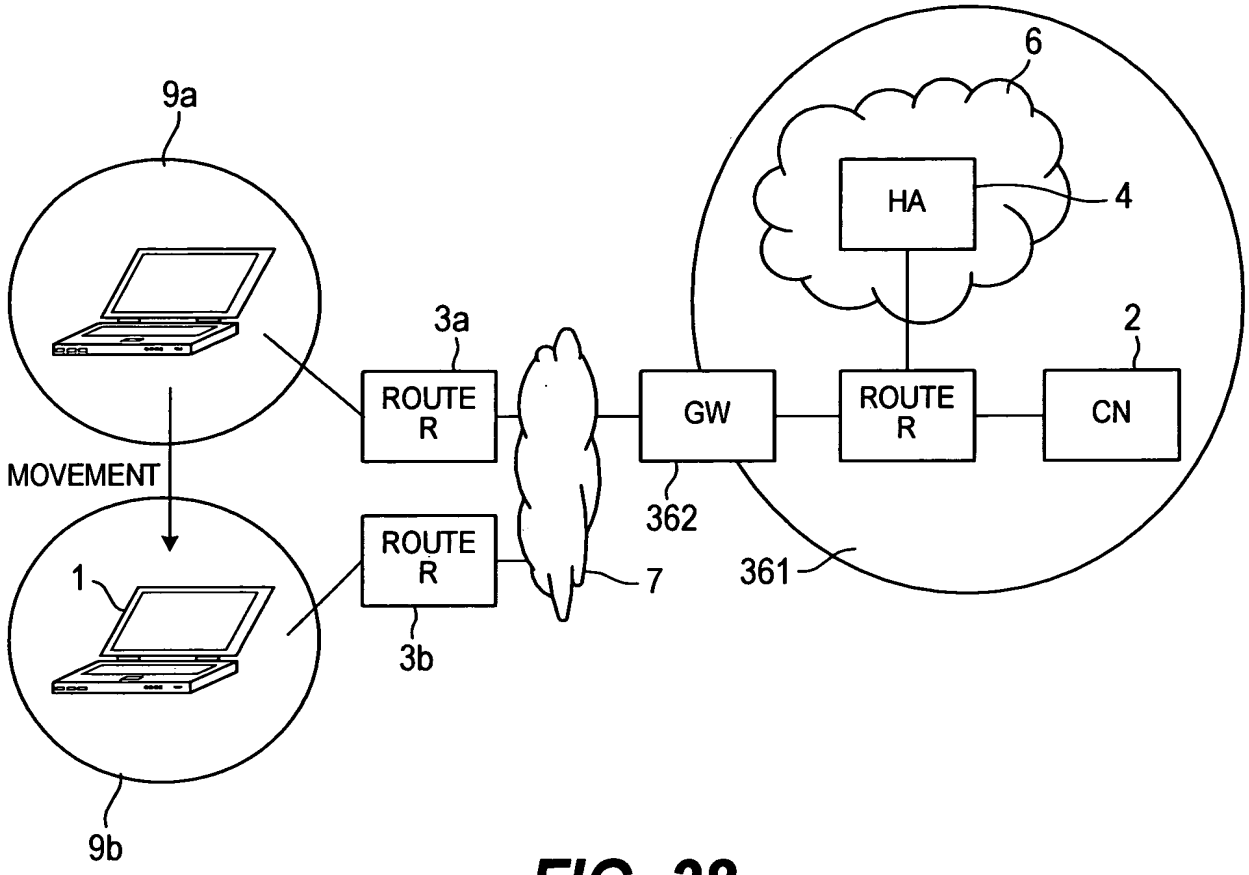
9a
6
HA
4
3a
2
ROUTE R
GW
ROUTE R
CN
MOVEMENT
362
ROUTE R
1
7
361
3b
9b

FIG. 38

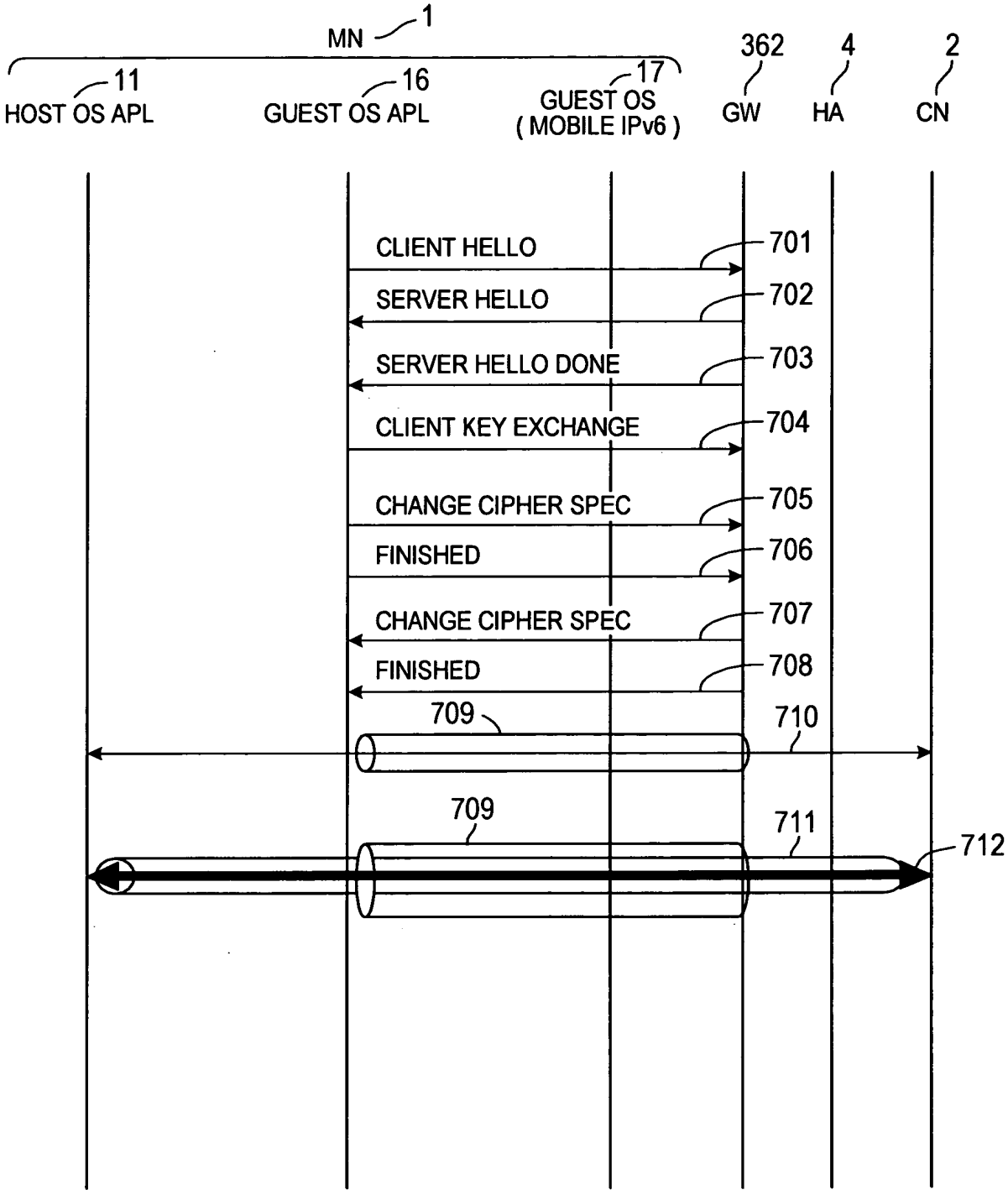
MN
1
11
HOST OS APL
16
GUEST OS APL
17
GUEST OS
(MOBILE IPv6)
362
GW
4
HA
2
CN
CLIENT HELLO
701
SERVER HELLO
702
SERVER HELLO DONE
703
CLIENT KEY EXCHANGE
704
CHANGE CIPHER SPEC
705
FINISHED
706
CHANGE CIPHER SPEC
707
FINISHED
708
709
710
709
711
712

FIG. 39